IDG.com

New take on wireless Start-up vendors set to bring switching gear to wireless LANs. **PAGE 10.**

Conference showdown Find out what will be hot at the ComNet show next week. **PAGE 37.**

NetworkWorld

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January 20, 2003 ■ Volume 20, Number 3

Technology INSIDER

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NOAH JONES

Linux taking aim at data center

■ BY PHIL HOCHMUTH

NEW YORK — The improving scalability of Linux, the low cost and increasingly high power of Intel hardware, and the license-free nature of open source software could add up to big savings for large corporations looking to bolster their data centers.

Showgoers at this week's LinuxWorld Expo will find 150 vendors — including Computer Associates, Dell, HP, IBM and Sun — ready to stoke their interest in mission-critical Linux products. Roughly 17,000 attendees — about the same number as last year's show — are expected to descend upon Jacob K. Javits Center, according to show organizer IDG World Expo, a sister company of *Network World.*

Merrill Lynch has taken the plunge. The Wall Street firm uses Linux on Intel servers and IBM mainframes for Web and file servers as well as compute-intensive applications for analyzing financial markets. Robert Lefkowitz, director of the technology architecture group, says the lower cost of ownership for Linux on Intel hardware is one of the reasons Linux has gained a foothold in the company's data center.

"If you have an environment that has a lot of Unix, then switching to Linux makes sense," Lefkowitz says.

"What we like about [Linux] is the idea that there's a free market in software," he says, where customers are not tied to a particular vendor's architecture, support and pricing. "And when you have a free market, it tends to drive down costs."

■ Egenera has developed a chassis to consolidate Linux-based servers. Page 17.

At the show IBM will announce several server and enterprise software products, including a new eight-processor pSeries server — based on its PowerPC architecture — running native Linux, as well as a new rack-mountable eServer x345 box running Linux on Intel Xeon processors as fast as 2.8 GHz — the highest-speed Linux

See Linux, page 57

New EMC Symmetrix arrays may cut costs for users

■ BY DENI CONNOR

HOPKINTON, MASS. — EMC on Feb. 3 is expected to unveil a trio of Symmetrix storage arrays that feature a modular design the company hopes finally will convince midrange users that high-end storage capabilities are within their grasp.

To attract customers to its top-of-the-line storage gear, EMC is letting them start with midrange Clariion arrays and then reuse those systems' disk drives, PowerPath high-availability software and Fibre Channel host bus adapters in new Symmetrix arrays.

"This capability makes it much easier for customers to call [the arrays] an 'upgrade' instead of a new purchase," says Kent Smith, principal consultant for IPSO, a business systems integrator in Wayland, Mass. "[Customers have]

See EMC, page 15

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010

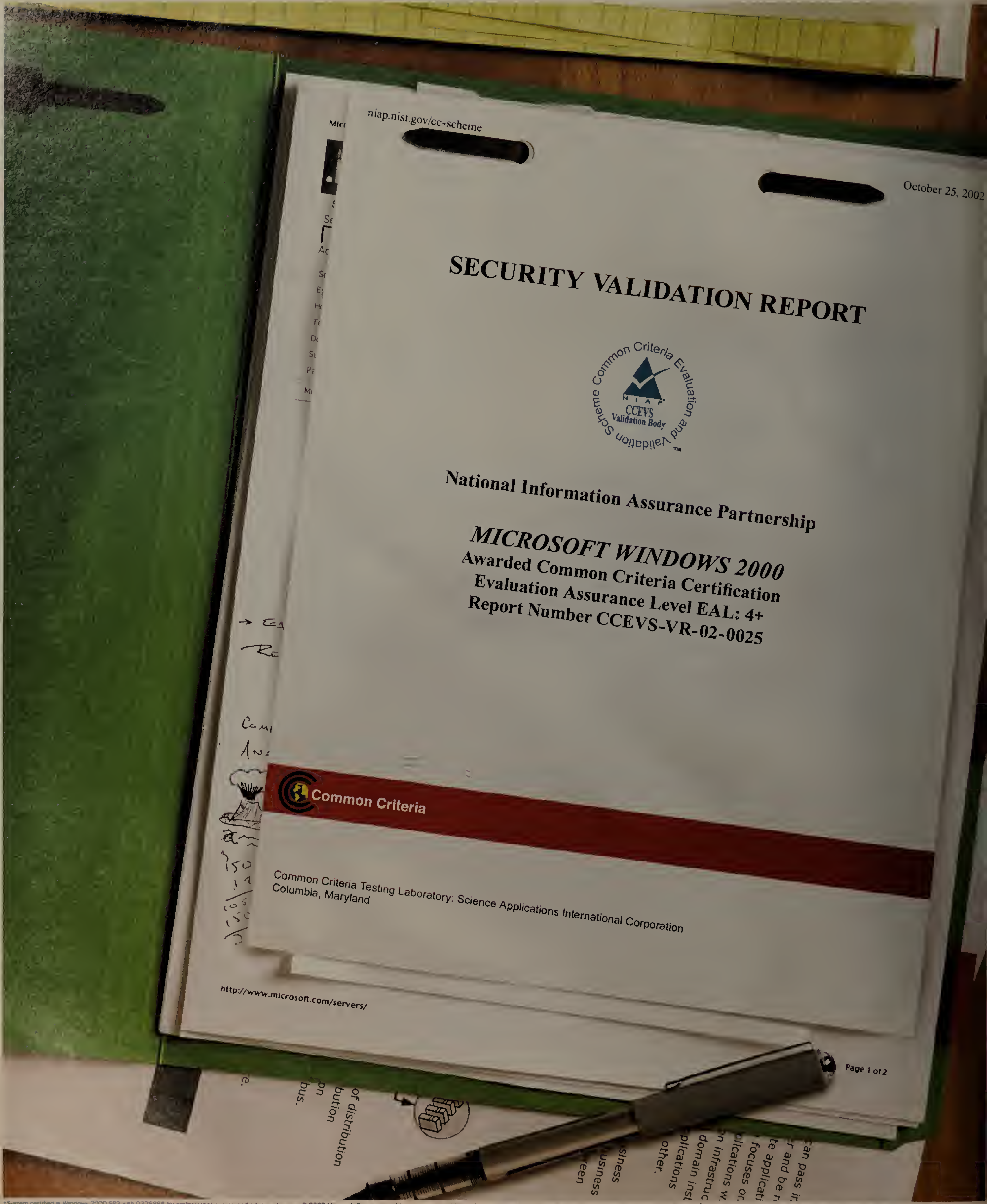
Your take Network executives share their wisdom

Page 12

For the latest in our series of network executive Q&As, we spoke with Amtrak CIO Bob Galey.

Read Galey's thoughts on:
- Outsourcing do's and don'ts.
- Tracking service-level agreements.
- Voice, data net priorities.

STEVEN B



niap.nist.gov/cc-scheme

October 25, 2002

SECURITY VALIDATION REPORT

Common Criteria Evaluation and Validation Scheme
N I A P
CCEVS
Validation Body

National Information Assurance Partnership

MICROSOFT WINDOWS 2000
Awarded Common Criteria Certification
Evaluation Assurance Level EAL: 4+
Report Number CCEVS-VR-02-0025

Common Criteria

Common Criteria Testing Laboratory: Science Applications International Corporation
Columbia, Maryland

http://www.microsoft.com/servers/

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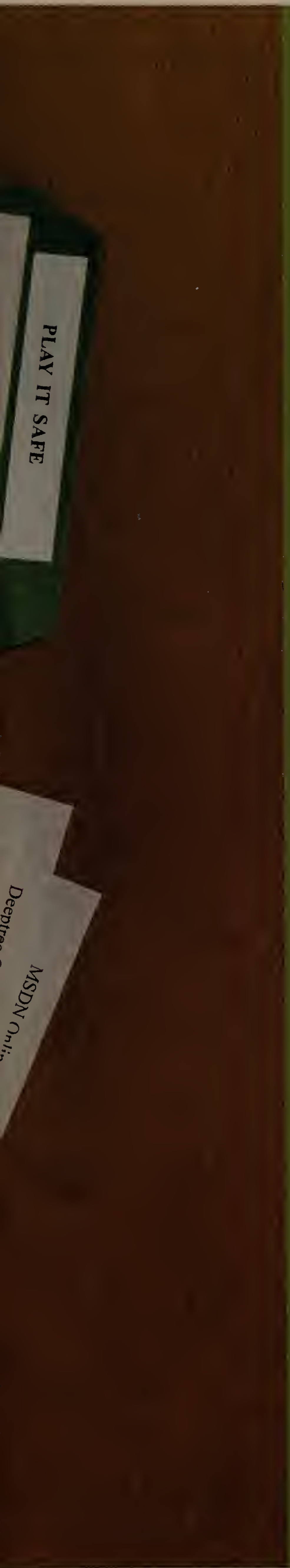

Trust the facts first. Microsoft® Windows® 2000* operating system has been awarded the highest level Common Criteria Certification for the broadest set of real world scenarios yet achieved by any operating system, as defined by the Common Criteria for Information Technology Security Evaluation (CCITSE). The Common Criteria (CC) is an internationally endorsed, independently tested, stringent set of standards that evaluate the security of technology products.

Windows 2000 desktop systems and server family were evaluated against CC requirements beyond the Controlled Access Protection Profile to include the following features:

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These results arm you with an unmatched level of confidence as you select secure products for your environment and mark an important milestone on the road to providing you the highest level of assurance in Windows and all Microsoft products.

For all the facts on Windows 2000 Common Criteria Certification and managing your security risk with Windows 2000, visit **microsoft.com/CCcertification Software for the Agile Business.**

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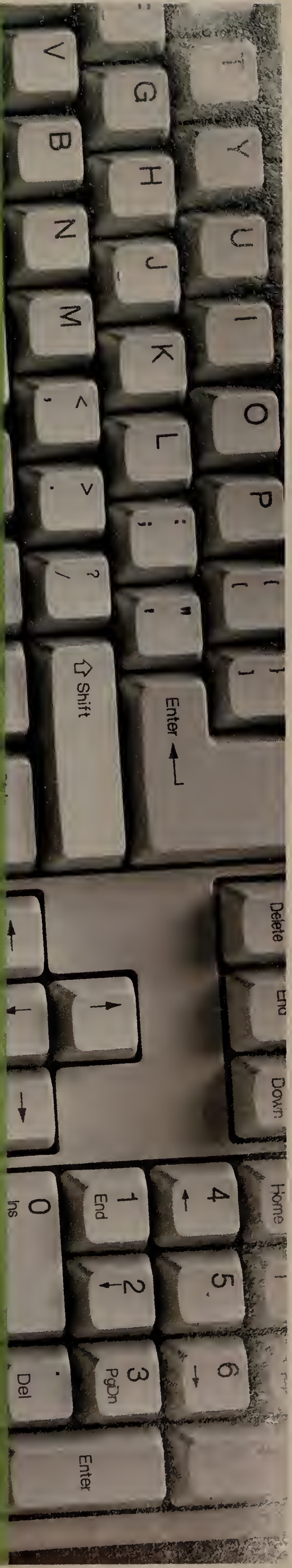

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TED RICE

Technology INSIDER IP-based contact centers

Goodbye ACDs, hello open architecture:

You need to move from the closed world of automatic call distributors and PBXs to applications running on industry standard servers.

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NOAH JONES

Goodbye TDM, hello VoIP:

And your crystal ball also should be telling you that the packet-switched world of voice over IP is in your future, while the circuit switched world of TDM is in your past.

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Interactive

Start-ups to watch

Know of a hot network newbie that could shake up the network world? Nominate it for *Network World's* 2003 10 Start-ups to Watch Award. We profile these companies in our annual Network World 200 Issue, a special Signature Series edition that publishes in April, and track their performance throughout the year. The deadline for nominations is Jan. 31.

DocFinder: 3933

ComNet 2003 Show Planner

Heading to D.C.? Check out our unabridged ComNet 2003 Show Planner for the keynote addresses, events, tutorials and discussions you won't want to miss. **DocFinder: 3930**

Seminars and Events

Service-level management

Start the year with industry visionaries who show you how to use service-level management to increase IT's value to the business, achieve better utilization of resources, minimize costs and increase user satisfaction. Register today for this free seminar, "Service-Level Management: Deliver on Your Network Guarantees."

DocFinder: 3932

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Private subnet

Fusion Executive Editor Adam Gaffin introduces you to Mike Kruckenberg, a system administrator at Tufts University, who describes the travails of moving three servers from a public network to a private subnet — in which he discovers the value of crossover cables.

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What good is the connected home?

Net.Worker Managing Editor Toni Kistner offers more reader reaction to a recent column on the connected home. Most want home networks that help them cook and clean.

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Home Base

Here's to a clutter-free 2003

Columnist Jeff Zbar describes tools that will help you organize your home office and increase your productivity.

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News Bits

Judge to Microsoft: Ship Sun's Java

■ After yet another tussle between rivals Sun and Microsoft, a federal judge last week gave Microsoft 120 days to start shipping Sun's Java as part of its operating system software. The ruling is part of a private antitrust suit Sun brought against Microsoft and comes after the two argued over terms of a preliminary injunction that District Judge J. Frederick Motz issued last month. Sun complained that Microsoft was trying to undermine the judge's ruling. Motz said he was willing to stay his 120-day ruling by two weeks in light of the fact that Microsoft likely would ask an appeals court to review it.

Comcast deal another pain for e-mail users

■ More than 2 million AT&T Broadband customers will get new e-mail addresses sometime in March. For about 200,000 of them, this is the third e-mail address change in 12 months. Comcast officially acquired AT&T Broadband in November for $30 billion and assumed $24 billion of the cable unit's debt. Customers with attbi.com e-mail addresses will be completely switched over to Comcast.net addresses within the next 60 days. All former AT&T Broadband customers will have to notify all parties of the e-mail switch or they will not receive their messages after Comcast takes the attbi.com system offline.

SAP unveils NetWeaver middleware

■ SAP last week took the wraps off its new integration and application server middleware, called NetWeaver, which is to become the platform on which all SAP business software will run. Based on Web services and aimed at easing users' integration headaches, NetWeaver can link disparate applications and data sources, letting companies make use of their existing IT investments and personnel skills while exploiting the power of Web services, SAP says. It's designed with heterogeneous IT systems in mind. NetWeaver is interoperable with Microsoft .Net and IBM WebSphere platforms, SAP says. Users can provision Web services that have been developed in Java or SAP's own development language, ABAP. NetWeaver will become the backbone for all SAP applications, the software maker says. It's the next generation of the company's mySAP Technology platform, which was introduced in 2001.

Powell pledges to protect competition

■ The Federal Communications Commission will not relax its rules governing the Baby Bells to a point where competition with local phone service providers is killed off, FCC Chairman Michael Powell told a group of U.S. senators last week. Powell, speaking before the U.S. Senate Commerce, Science and Transportation Committee, offered few details on what direction the FCC plans to take during its so-called triennial review of rules governing the regional Bell operating companies and their unbundled network elements under the Telecommunications Act of 1996. The FCC decides what UNEs the RBOCs must make available to competitors at wholesale prices. Powell disputed press reports that the FCC was headed toward a drastic overhaul of the rules allowing providers such as WorldCom and AT&T to access some network elements owned by the RBOCs, including Verizon and SBC. The Baby Bells will have to offer some access to competitive local exchange carriers. "I pledge that to you right now," Powell said.

MandrakeSoft files for bankruptcy

■ Linux distributor MandrakeSoft last week said it had filed for bankruptcy protection at a court in its home country of France. The company said a series of quarterly losses led to the filing but that current operations would continue, including the release of Version 9.1 of its software due in April. Financial problems at the company became public last year when an appeal appeared on its Web site asking users to contribute to a Mandrake Linux Users Club and Corporate Club. Money raised would be used to help support the company and support development of future distributions of its software, it said at the time.

Linux group touts carrier version

■ UnitedLinux, a common Linux operating system from four vendors, will later this quarter be updated to make it suitable for carrier-grade servers. Carrier Grade Linux 1.1 features will be available as a service pack for UnitedLinux 1.0. The expanded operating system will let carriers develop and deploy new products and services at a lower cost on a standards-based and modular platform, the UnitedLinux group says. UnitedLinux with the CGL features initially will work only on Intel-based hardware platforms, according to a statement. The CGL features were defined by a working group of the Open Source Development Labs, an independent, nonprofit laboratory created in August 2000 to help Linux developers add enterprise capabilities to the open source Linux operating system. OSDL member companies include Dell, HP, IBM, Intel and SuSE Linux.

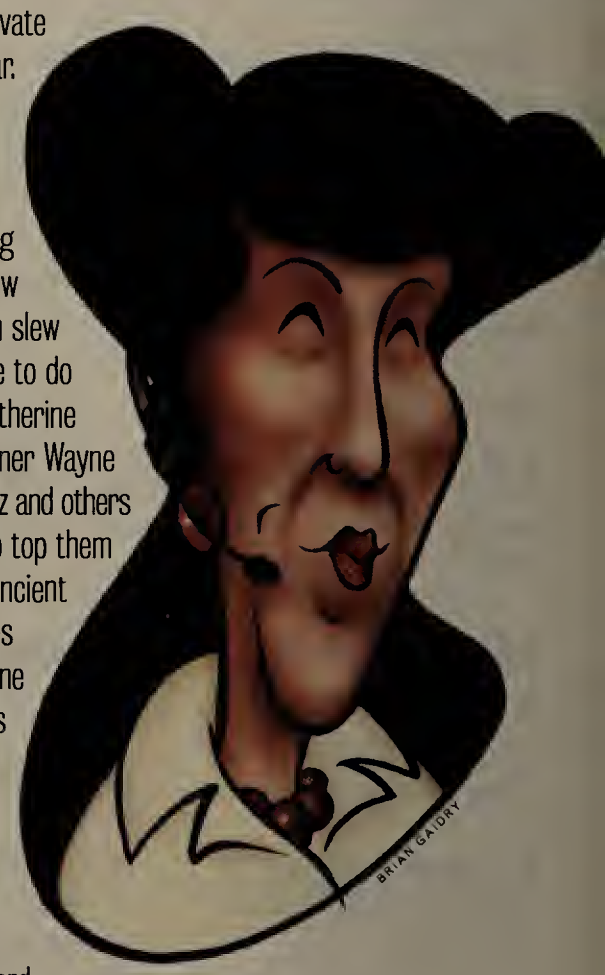
[illegible]

Carriers are blowing wireless

Clay Shirky says carriers face the same fate as FedEx did in the 1980s when it set up a fax service – they're ignoring the fact that users are connecting their own smaller wireless networks.

Read more at: www.nwfusion.com, DocFinder: 3938.

■ TheGoodTheBadTheUgly



IBM protecting IBM. Jobs don't get any more secure than patent attorney at IBM. According to the U.S. Patent and Trademark Office, Big Blue was awarded 3,288 patents in 2002, ranking IBM at the top of the private sector for a 10th consecutive year. Canon ranked second with 1,893.

Starstruck. As if it isn't bad enough having vendor marketing departments telling you about how great their products are, a fresh slew of celebrities is now on the scene to do the same. There's movie star Catherine Zeta-Jones for T-Mobile, entertainer Wayne Brady for Avaya, TV's George Lopez and others for Nextel, and WebEx is about to top them all by resurrecting Lily Tomlin's ancient Ernestine character from the '70s show Laugh-In. Of course, Ernestine has to be a step up from WebEx's original celebrity pitch person — supermodel RuPaul. ➤

WorldCom sings. New WorldCom CEO Michael Capellas obviously is trying too hard to turn the company around. Last week he urged employees during a publicly Webcasted meeting "to hold hands and sing 'Kumbaya, My Lord.'"

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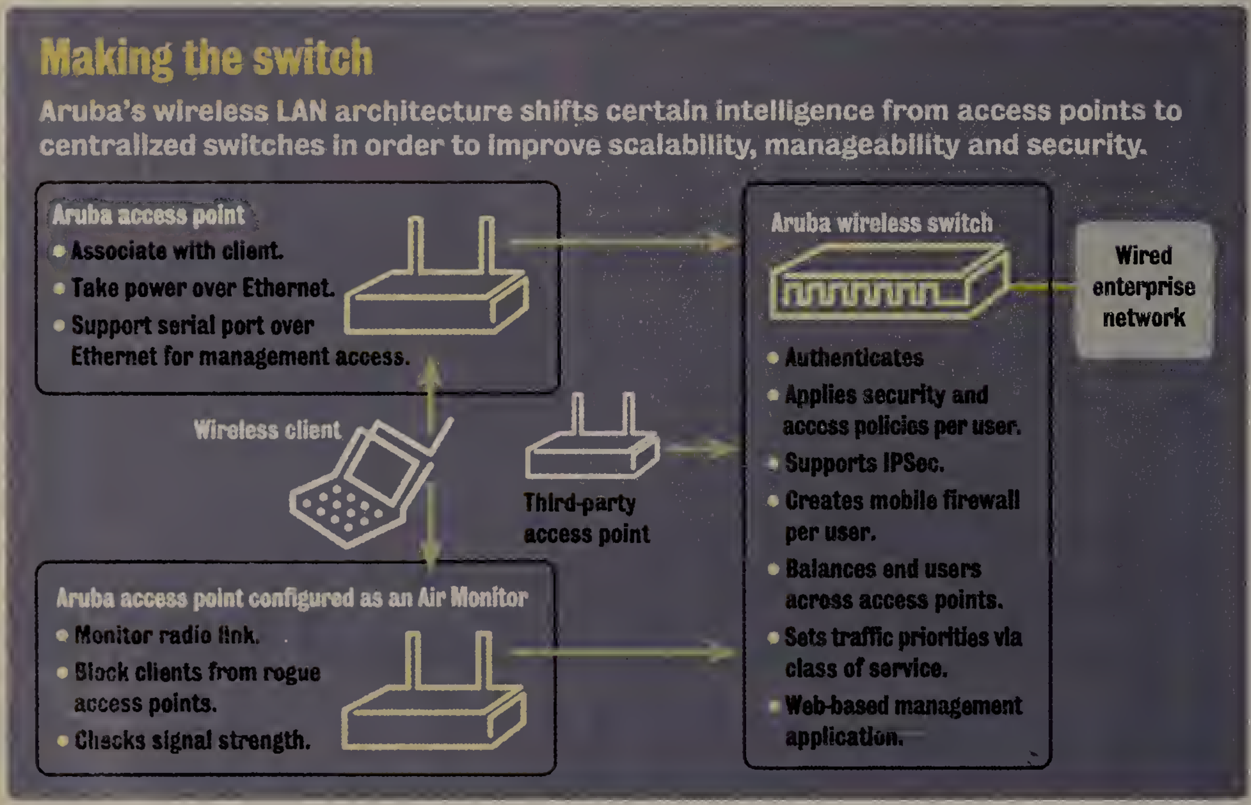
Wireless LANs to get switch support

BY JOHN COX

SAN JOSE — A pack of start-ups is racing to create a new generation of wireless LANs based on wiring-closet devices that connect to wired backbones and control up to hundreds of access points and thousands of end users.

First out of the gate is Aruba Wireless Networks, a 40-employee company that this week starts beta tests of a wireless LAN "switch" and access points it says will give network executives as much control over their wireless networks as they have over wired ones. Close on its heels is AirFlow Networks, which is about to begin beta-testing its switch, and BlackStorm Networks and Trapeze Networks, which are expected to start revealing their plans in coming weeks.



Making the switch

Aruba's wireless LAN architecture shifts certain intelligence from access points to centralized switches in order to improve scalability, manageability and security.

Aruba access point
Associate with client.
Take power over Ethernet.
Support serial port over Ethernet for management access.
Wireless client
Third-party access point
Aruba access point configured as an Air Monitor
Monitor radio link.
Block clients from rogue access points.
Checks signal strength.
Aruba wireless switch
Authenticates
Applies security and access policies per user.
Supports IPSec.
Creates mobile firewall per user.
Balances end users across access points.
Sets traffic priorities via class of service.
Web-based management application.
Wired enterprise network

"This [Aruba product] was like nothing I had seen in the wireless arena," says Neil Buckley, manager of network security at Partners Healthcare, a Boston HMO. "It has integrated in one core switch all the features of a VPN, firewall and intrusion-detection system. You have real-time visibility into your wireless LAN."

Wireless LANs today are largely a group of individually deployed access points that connect to a wired LAN. Individual users connected to one access point must share the available throughput, which is typically 5M to 7M bit/sec for IEEE 802.11b nets, and roughly 15M to 20M bit/sec for 802.11a networks.

Network executives have to add third-party radio monitoring and packet analysis software, VPN concentrators and client software, and firewalls designed for low-speed dial-up connections. There is a painful lack of wireless LAN management tools.

That's precisely the case at Partners Healthcare, where wireless LAN deployment has stalled at about 60 Cisco Aironet access points. "Today, [management] is all manual," Buckley says. "Any changes that need to be made, need to be done to all of the access points. That's not where you want to be in terms of [keeping down] operational costs."

By contrast, Aruba is adopting an approach similar to that used by Ethernet hub pioneers such as SynOptics: multiple devices connecting to a central wiring-closet box, with each client device connected via a different "port." Although ports don't actually exist in wireless LANs, which use radio frequency instead of cables, control has to be exercised individually over each wireless user, and maintained as the users move across a set of wireless access points at a given site.

Aruba access points forge the radio link with client devices. These access points also can act as "air monitors" that constantly search the frequency for packets from new radios, whether on clients or access points, authorized or not. Using patent-pending software, the Aruba access points can block end users from connecting to a so-called rogue access point, which might be nothing more than one across the street in a Starbucks coffee shop, says Aruba co-founder and CEO Pankaj Manglik, who previously worked at switching companies Cisco and Alteon.

Users are passed directly to the Aruba switch, which handles all the authentication, access policies and encryption, as well as creating a personal firewall for each user to control his Web access. Once authenticated, the switch lets the packets from the wireless LAN to shift the wired network.

Manglik says that by "walling" wireless LANs behind a central firewall, then requiring a VPN to access resources on the wired net, network executives are boxing themselves into an architecture that can't support large numbers of users at LAN, or even wireless LAN, speeds.

Another benefit of using Aruba access points with the switch is that they can work together, using another patent-pending software program, to constantly measure signal strength and user number, and then create a continually changing map of the wireless LAN. If one access point fails, or becomes too crowded with users, the switch can change the power settings on each access point radio, or move users to one or more other access points.

Aruba, which has $10 million in first-round venture funding, has upgraded its switch software so its box can work with Cisco Aironet access points. But when working with third-party devices, the switch can't create dynamic site maps or monitor airspace for rogues.

An official definition of "wireless switch" does not exist, and the market is getting crowded with claimants. But even Aruba and BlackStorm executives stop short of promising switched wireless bandwidth. "You won't have Gigabit Ethernet in a wireless LAN," says Alan Cohen, vice president of marketing for BlackStorm.

Vendors including Bluesocket, Cranite Systems, Fortress Technologies, ReefEdge and Vernier Networks, have built security gateways for wireless LANs, sometimes adding class-of-service features to set traffic priorities (see story at www.nwfusion.com, DocFinder: 3939). These vendors all say they plan to add switching features.

AirFlow says it has alpha units of its AirSwitch installed at a few customer sites, and will shortly launch the beta-test phase. AirFlow's switch will plug into a wiring closet router and work with streamlined access points, dubbed AirScouts (a company diagram is at DocFinder: 3940).

BlackStorm, which received an undisclosed amount of funding last spring, appears to be addressing the same problem as Aruba. "Today's access points are like bug lights —clients attach to the brightest one," Cohen says, adding that more details will be made public in a few weeks. But he says the security gateway companies typically do not provide detailed examination of, and information about, the actual wireless packets.

Last September, wireless pioneer Symbol Technologies introduced its Axon box (see story, DocFinder: 3941), which connects to streamlined Symbol access points and runs Layers 2, 3 and 4 switching software to process the wireless packets. Axon plugs into a wiring closet's Ethernet switch. More recently, start-up Vivato unveiled plans to build what it termed a wireless switch, but so far has revealed little more, except that it is based on a phased array antenna to focus radio beams on individual clients (DocFinder: 3942).

Cisco so far has talked of integrating its access points with its network management infrastructure, although industry watchers say they wouldn't be surprised to see Cisco snap up a wireless LAN switch start-up if customers starting buying into the concept. ■

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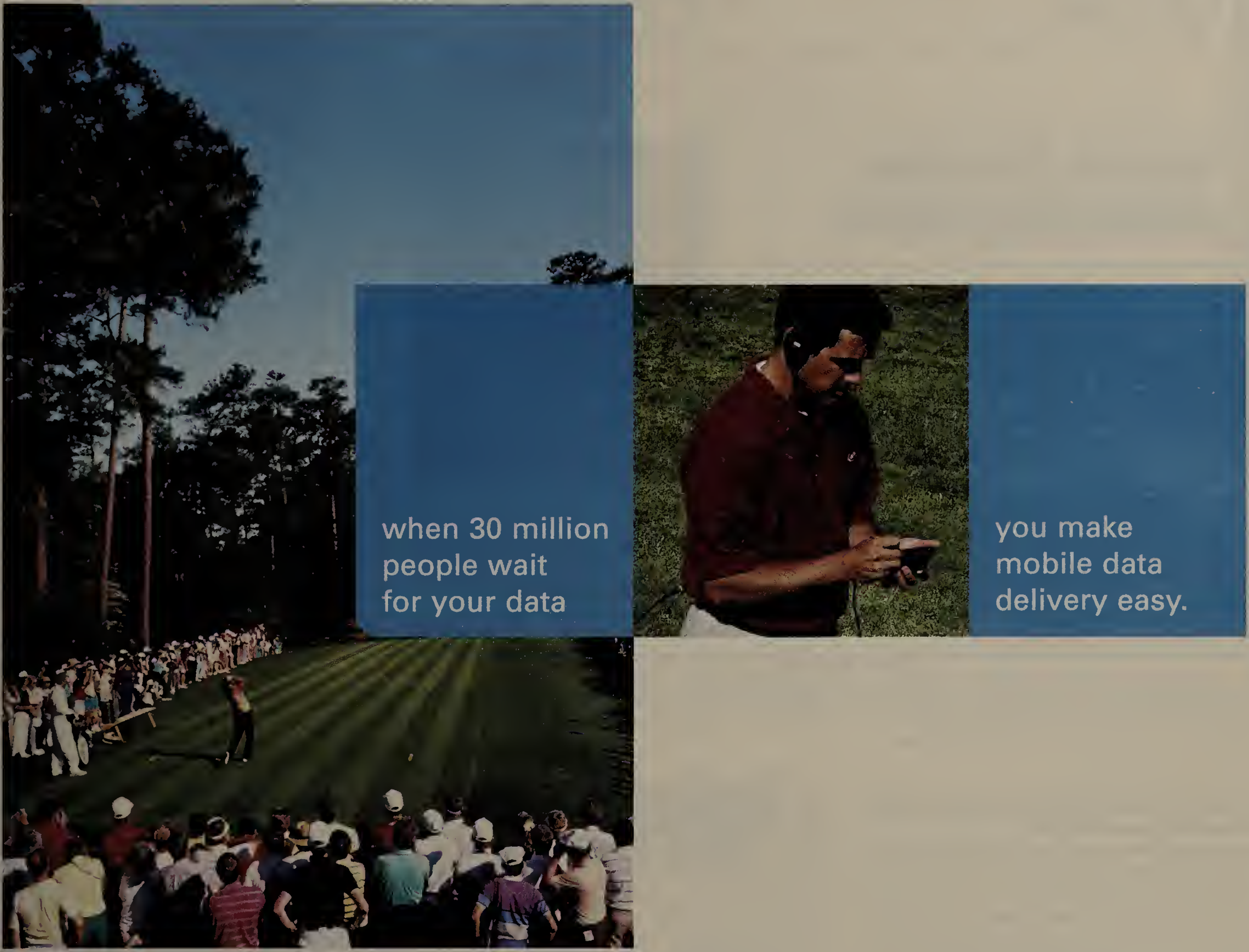

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Network executives share their wisdom

Amtrak CIO offers outsourcing advice

Under tight financial constraints, Amtrak last year signed a seven-year, $330 million deal with IBM that involves outsourcing most of the passenger railroad's IT services, including operation of its voice and data networks. Amtrak CIO Bob Galey recently spoke with Network World *Senior Editor Carolyn Duffy Marsan about how best to structure and manage a network outsourcing arrangement. Here are excerpts from their conversation:*

PHOTOS STEVEN BIVER

What do you oversee?

My office handles all of the IT except for the train control systems. We have a very large reservation system and associated Web sites. We also have an awful lot of financial systems. We keep track of who the crews are on the trains and where they are, the customers on the trains, and all the incidents that happen on the trains. We have 530 stations where we pick up people. We have a network connecting half of those stations, and the other half are through dial-up. It's a frame relay network. We have about 7,000 desktops and two fairly large mainframes. We have 450 servers that we support. We also support the voice network.

Given that you've outsourced most of your IT services to IBM, what IT functions have you retained?

I have a staff of 296 people. The vast majority are software developers. That [function] is not outsourced. And we don't outsource [operation and maintenance of] our servers. We oversee the outsourcing agreement in two ways: the administration of the contract and the operation of the contract. We take the lead on planning for our LANs but not for the WAN. IBM works with AT&T on our WAN. IBM has about 150 full-time equivalents that support us.

How do you and IBM divide responsibility for Amtrak's voice and data networks?

We have an internal voice network that connects all of our sites so you don't have to dial out to place a call. That's probably a quarter of our budget for voice. The vast majority of our budget in voice has to do with our call centers, which use inbound 800 services. The call centers cost about $12 million to $13 million a year. IBM has responsibility for the switches and desktops in the call centers, but we man them. We plan the technology upgrades for the call centers along with IBM.

The data network is all the responsibility of IBM. The contract is written so that they have to provide us with the services we need. They also manage the network. That's something we would have a hard time doing ourselves on this scale. It's their responsibility to keep us in the right range [on bandwidth] so that we're not overpaying or underpaying or overutilized. We've retained responsibility for our overall IT architecture.

When you renegotiated your outsourcing deal with IBM six months ago, how did you define the voice and data services?

The old contract was written in 1994 and patched up a few times, but it was not very specific. Unlike a good wine, it didn't age well. The new contract is very specific. We've broken the contract into 10 towers of service, [such as] voice or data or desktop support. The term sheets for each of those towers of service lays out in gory detail who is responsible for what. Attached to that is a procedure manual that describes not only what needs to be done but how. And tied to that are service-level agreements. IBM's been working on a score card that is tied to our incident management system so that every day we'll be able to see where we are compared with the [service-level agreements].

What are your top priorities with regard to your voice and data networks?

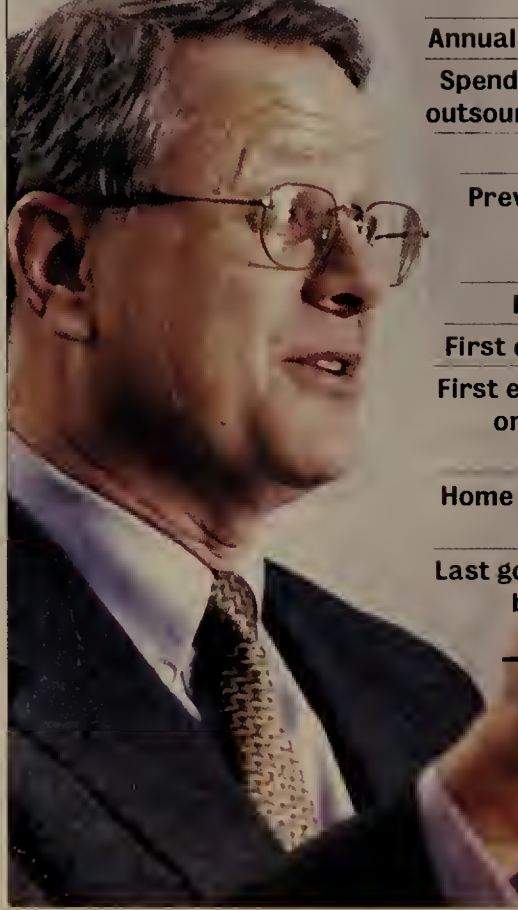
We have one basic goal this year, which is to meet the availability and reliability criteria with our networks. There's a big difference between 98.5%, which is what we had on the old contract, and 99.9%, which is where we're headed with our new contract. That gives us a half-hour more of uptime per month. So far, we're doing pretty well. You're always going to have problems with a large frame relay network. What we were looking for on the WAN side was better response times, so the SLAs reflect that. We don't want outages to last for long periods of time. In major locations, we wanted better backup facilities.

Do you have any plans to upgrade the network infrastructure in the next year?

We have a lot of end-of-life servers, and we're upgrading those. We've already purchased everything, so no calls, please. We have about 450 servers. We're upgrading 30% of them. We have both NT and Unix servers. Anything that's facing the Web uses Unix, primarily [Sun] Solaris. Our Web site, Amtrak.com, is based on Unix. We recently upgraded that Web site. Three years ago, we were handling about 4,000 transactions per day in terms of booking tickets. We just had our highest day ever of 9,400 transactions. Now 23.4% of our tickets are sold over the Web. A good number of the NT servers we have

See Amtrak, page 16

Getting personal



	Bob Galey
Title:	CIO (since January 2000)
Organization:	Amtrak
Responsibilities:	Oversees all IT in the company except for train control systems. These include voice and data networks, Web sites, reservation systems, logistics systems and business systems.
Annual IT budget:	3.5% of Amtrak's total budget.
Spending on IBM outsourcing deal:	$48 million per year.
Staff size:	296 employees, 150 contractors.
Previous jobs:	CIO of WMF Group; various positions in the CIO office at DynCorp; various IT positions at Blue Cross Blue Shield, Nasdaq and the Navy.
Education:	Bachelor's degree in management from the University of Maryland.
First computer:	An IBM 1410, which didn't have peripherals.
First experience on the 'Net:	At DynCorp in 1994, where the company pitched a crude Internet application that helped it win a contract with the Strategic Petroleum Reserve.
Home computer network:	A 450-MHz eMachine on an 802.11b wireless net and with cable modem access to the 'Net.
Last good mgmt. book read:	"I don't read many of them. I read industry magazines. I go to conferences. I read a lot of white papers. I spend a lot of time on the Web reading general news."

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You click the icon and discover the company has assembled a package of updates specific to your system, from additional memory and fancy new speakers to, yes, a CD-RW drive. There's also security software available that you've been meaning to look into, but you're not sure what you need.

You click the "Web chat" icon and begin exchanging messages with a customer service representative. Eventually, you decide you'd rather talk on the phone to the representative, so you click the "Call me" button. In a few seconds, the phone rings and there's a representative on the line who knows that you've got questions about security software. Soon your questions are answered, and the new CD-RW drive and security software are on the way.

Although this scenario may seem like a customer service dream, it is increasingly becoming a reality as companies take advantage of contact center solutions from Cisco Systems that enable them to integrate all customer contact channels—voice, e-mail and Web.

With Cisco IP Contact Center (IPCC) solutions, companies can deploy an integrated contact center with automatic call distribution (ACD), advanced reporting, interactive voice response (IVR), computer telephony integration (CTI), Web collaboration, e-mail response management, outbound campaign management and a host of other features. Depending on customer requirements, the Cisco solution can work in a legacy, multivendor time-division multiplexing (TDM) environment, a hybrid TDM/IP contact center or a pure IP contact center that uses other tools within Cisco IP Communications solutions.

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By enabling migration at a customer's own pace, Cisco IPCC provides a bridge between IP and TDM environments. Much more than a traditional ACD riding atop IP call processing, Cisco IPCC handles contact routing across networks with multiple, distributed contact centers equipped with different vendors' ACDs, IVR systems and back-end databases. This ensures that each customer contact is routed to the most appropriate available agent—no matter where that agent resides and regardless of the network environment.

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Cisco IPCC provides benefits that customers will immediately recognize. IVR systems, whether TDM or IP and whether from Cisco or a third party, can be used to collect a caller's preliminary data, such as an account number. Predefined scripts then determine how Cisco IPCC routes the call. Perhaps all Platinum account holders are handled by a select group of agents, or callers with an overdue balance are directed to employees experienced in handling these matters.

When the call is connected, the agent receives a CTI screen pop with all relevant customer and call data. Should the call later need to be transferred or escalated, the customer data goes with it. This keeps call times to a minimum and customers happy, since they don't have to repeat themselves. These benefits, in turn, result in significant cost savings.

Cisco e-mail management tools provide similar productivity benefits, such as prompting customer service representatives with appropriate, prepared responses based on the context of incoming mail. Cisco Contact Center solutions also enable agents to provide Web-based customer services, such as text chat. That means the same agent can handle any type of contact channel — voice, e-mail or Web — while Cisco IPCC ensures they give priority to the more time-sensitive channels.

Cisco Contact Center solutions provide benefits for organizations of all sizes and situations, from a handful of agents to large organizations with many locations and thousands of agents. Using Cisco IPCC to tie together multiple, distributed contact centers into a logical whole provides significant flexibility in contact routing. Companies can take advantage of subject matter experts regardless of their location and can more equitably distribute calls across all available agents. These capabilities help reduce call times, benefiting both the company and the customer.

Multi-Channel Interaction: Cisco Contact Center solutions enable customers to interact via phone, Web call-back, VoIP, text chat or e-mail.

The solutions are also pre-integrated with all major ACD and IVR products, as well as with Web and e-mail channels. Customers don't have to worry about working with multiple vendors and getting them to work with one another. Additionally, Cisco can provide integrated statistics and consolidated reporting in a multivendor, distributed contact center environment, enabling companies to more easily get a complete, accurate picture of all contact center interactions and saving contact center managers considerable time and effort.

Although Cisco solutions enable companies to preserve investments in existing TDM equipment, customers will realize the most benefit as they migrate to an all-IP contact center. By employing an IP infrastructure built on Cisco AVVID (Architecture for Voice, Video and Integrated Data), companies can realize cost savings from toll bypass, as well as additional location-independence for contact center agents who can work anywhere a business-class Internet connection is available.

Contact center agents will become more productive as well, as they employ tools such as a PC-based IP softphone that effectively ties their phone together with voice, e-mail and Web-based contact applications. Additionally, after a company has Cisco IPCC installed in one location, its central routing logic can be shared across any number of other sites. That makes it simple to add additional contact centers as requirements dictate.

Cisco has implemented Cisco IPCC solutions in all of its own contact centers worldwide. "The exciting part of moving toward a pure IP contact center environment is that in addition to providing us with considerable cost savings, it also improves how we interact with our customers," says LaVeta Gibbs, director of the Cisco Technical Support Group. "The use of Cisco IP Contact Center with Web collaboration has enabled us to increase our customer satisfaction scores while simultaneously reducing call duration. Additionally, as we teach our customers how to better use the Web, we've seen an increase in the use of the Web for reporting customer issues and our call volume has been reduced by nearly 50%—resulting in significant savings in time, resources and costs."

This is the fifth of a six-part advertising series on Cisco IP Communications solutions. Look for a profile of a Cisco Contact Center customer in the Feb. 17 issue.

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EMC

continued from page 1

very little new-purchase capital budget right now."

The DMX family of Symmetrix arrays consists of three models — the DMX800, DMX1000 and DMX2000. The DMX800 is the company's first rack-mountable Symmetrix and contains 16 to 120 73G byte or 146G byte Fibre Channel drives operating at 2G bit/sec. The DMX1000 is a single enclosure that contains 48 to 144 drives. The DMX2000 is a two-enclosure system with 96 to 288 drives for a maximum useable capacity of about 42 terabytes. The array uses 10,000 and 15,000 RPM drives.

While EMC declined to comment on the upcoming news, industry analysts offered their praise.

EMC's Symmetrix DMX family

The modular structure of the new Symmetrix products makes them suitable for midrange and high-end storage customers.

Models	Number of drives	Max. capacity
DMX800	Up to 120	17.5 terabytes
DMX1000	Up to 144	21 terabytes
DMX2000	Up to 288	42 terabytes

- 2G bit/sec Fibre Channel drives.
- 9 drives per Fibre Channel arbitrated loop.
- 256G bytes of cache.
- Matrix-switching capability increases performance.
- Converts Clariion midrange storage to Symmetrix.

"We expect EMC's announcement to be important for its legacy customers, as well as midrange clients that may not yet have had an EMC relationship," says Tony Prigmore, senior analyst for the Enterprise Storage Group.

In a departure from its previous Symmetrix systems, the new releases are modular, rather than monolithic. Demand for the latter systems is growing more slowly than for modular, midrange storage, analysts say. Gartner expects high-end storage to increase from $7.4 billion in 2001 to $8 billion in 2006. By contrast, midrange, modular storage will grow from $5.9 billion in 2001 to $9 billion in 2006. HP leads the midrange market with a 35.5% market share, Gartner says. EMC has a paltry 5% market share in midrange storage, while it dominates the monolithic market with 41.5%.

In monolithic storage, the RAID controllers and disk drives are packaged with cache memory and high-availability features in a single large cabinet that is then populated with terabytes of disk drives. Systems such as the Symmetrix 8000, IBM's Enterprise Storage Server (code-named Shark) and Hitachi Data Systems' Lightning are examples of monolithic storage. Users without huge capacity needs might buy monolithic storage with its high-availability and performance features, understanding that they won't be able to provision it with all the disk capacity it is capable of using.

Modular storage, which is common to HP's Enterprise Virtual system, Dell's PowerVault storage and EMC's Clariion, normally doesn't have large enclosure, high-availability features and large cache memory. It separates RAID controllers from disk drive modules, which are housed in standard racks, letting users add capacity and availability features as needed. Customers will provision the modular storage with high-availability features and cache memory when they buy new storage disks.

Also, in contrast to the previous Symmetrix bus-based architecture, the new Symmetrix models use a matrix switched-loop architecture that connects as many as nine trays containing disks to storage controllers, thus speeding performance.

In traditional Fibre Channel systems, one controller connects to one or two disk trays via a Fibre Channel arbitrated loop, which controls the passing of data over the network. EMC's new architecture improves performance without saturating bandwidth and, according to EMC, provides better performance than InfiniBand, sources say. The matrix also allows internal operations that are five to 10 times as fast as previous Symmetrix systems. Sources say the company has tested more disks per loop and will support them in the future.

Analysts say the new matrix switching architecture is a surprising feature from a vendor that has relied heavily on bus-based architectures.

"They will go to a new architecture, which will substantially improve their throughput and performance," says Roger Cox, chief analyst for Gartner. "Boxes are growing bigger and bigger, therefore you have to have more horsepower to handle the capacity."

Pricing for the new products has yet to be set. ■

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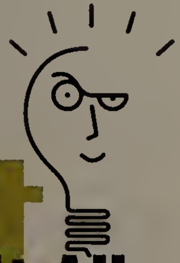

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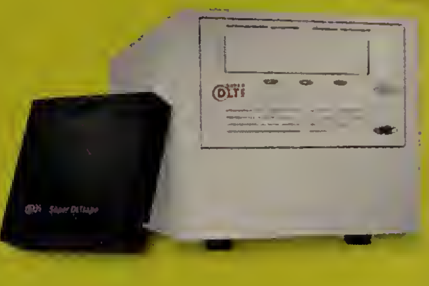

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Retailers told not to skimp on IT

BY ANN BEDNARZ

NEW YORK — Retailers can expect slow sales through the first half of the year, but that shouldn't keep them from making technology investments that can improve operational efficiency and raise profit margins.

That's the message from financial analysts who spoke at last week's National Retail Federation conference. Retail IT executives also shared their stories with 15,000 attendees and talked about the competitive advantage of deploying products that improve customer service, make stores run more efficiently, and enable integration among retailers' and suppliers' IT systems.

Participants agree the challenge for retailers is to think strategically. Wall Street is looking for innovation from retailers, said Angela Selden, managing partner at Accenture. In the past, Wall Street placed greater emphasis on short-term sales indicators.

"You could argue that innovation is one of the last things on the minds of retailers today," Selden said. "Instead, it's reduce product development costs, trim inventories, optimize the labor in the stores, hold back on those interesting acquisitions."

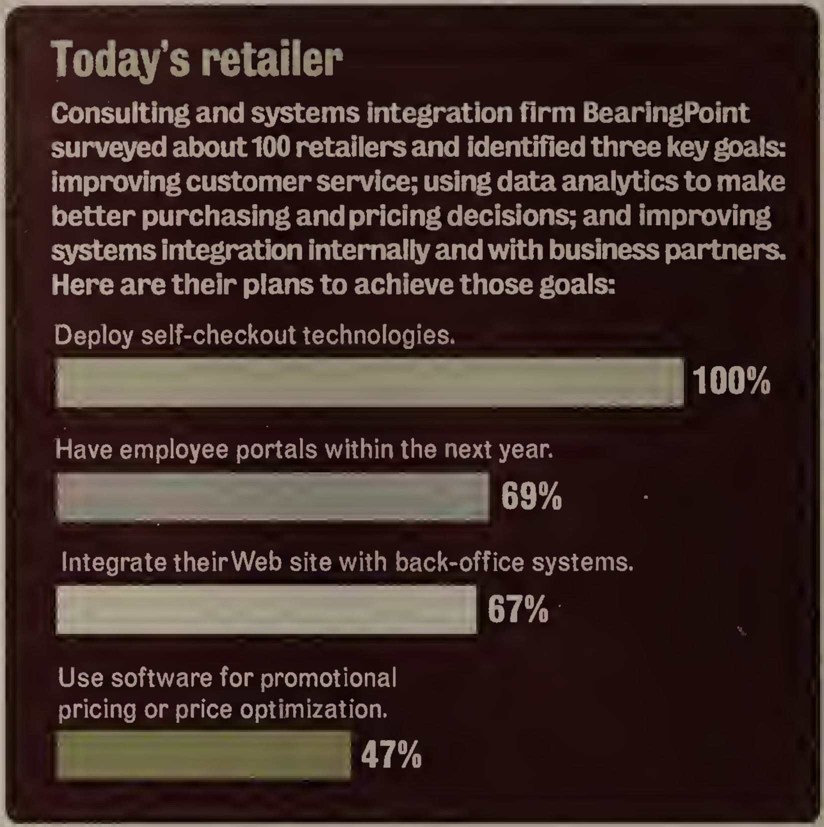
The exception are retailers such as Wal-Mart and Burberry, which Accenture calls market makers. These companies have responded to economic challenges by continuing to innovate, acquiring companies at favorable prices and investing in technology in preparation for the future. "They're taking full advantage of the economy right now," Selden said.

Instead of narrowly focusing on short-term earnings, Wall Street is starting to reward companies that use technology to increase profits over the long term, said Scott Tobin, a general partner at Battery Ventures. In turn, Battery Ventures is looking more seriously at technologies designed for the retail sector.

In particular, the firm is focused on analytic software that can sort through and glean useful metrics from the terabytes and petabytes of data that retailers accumulate.

Over the past several years, retailers have allocated their technology dollars to infrastructure products that connect distribution center systems to warehousing systems, for example, or connect point-of-sale and inventory systems, Tobin said.

"Much of this infrastructure has done nothing but create mounds and mounds of data," Tobin says. "The CEOs and CFOs are going to the CIO and saying, 'You know, you spent all this time and all this money implementing this infrastructure, and I still can't tell when this bathing suit is supposed to go on sale.'"



Today's retailer

Consulting and systems integration firm BearingPoint surveyed about 100 retailers and identified three key goals: improving customer service; using data analytics to make better purchasing and pricing decisions; and improving systems integration internally and with business partners. Here are their plans to achieve those goals:

As examples of innovative analytic software makers, Tobin cites ProfitLogic and Netezza — both Battery Ventures-backed companies — and BrickStream.

The ProfitLogic software sorts through historical POS data and helps retailers decide when and how much to discount surplus merchandise. The Netezza product gleans business intelligence from terabytes of data faster and more affordably than existing products, Tobin said.

BrickStream's software analyzes video feeds from store floors to help retailers design better store layouts.

"Our bet is that in the future, everybody at the merchandise level is going to be able to pick inventories more profitably, discount more profitably, and promote more profitably" using analytic software, Tobin said.

Throughout the show, retailers talked about technologies they're investing in and what they stand to gain from new rollouts.

Marc Saffer, CIO at athletic shoe retailer Footstar, is interested in software that analyzes more than just transaction data to reveal what customers want. The West Nyack, N.Y., firm is looking into in-store applications, such as traffic counters, to augment sales data.

Part of the reason Footstar wants better insight into customer preferences is that buyers are spending less time in stores and doing more online research.

"People come in specifically for this shoe, in this size and this color," Saffer said. "If we don't have the first thing they want, it's very difficult to get them to buy another thing."

Data synchronization has been a key initiative for Procter & Gamble, said Steve David, CIO at the Cincinnati consumer goods manufacturer. With data synchronization, retailers and suppliers agree to use standard product descriptors to streamline the exchange of information.

Procter & Gamble is using the data model from nonprofit standards organization UCCnet. The project has paid for itself already, just in the reduction of purchase-order errors and returned merchandise, David said.

Retailer Ross Stores plans to implement a new merchandising system and labor management software from SAP, said Richard White, CIO at the Newark, Calif., company. The goal is to better allocate staff, control payroll and reduce scheduling chores. ■

Amtrak

continued from page 12

are used as an interface to the reservation system [which runs on an older IBM architecture].

Where does the Internet fit in your overall network architecture?

We provide Internet access to most of our employees with workstations. We have 25,000 employees and only 7,000 workstations. Most of our employees are on trains moving around, and they don't have Internet access. We looked into what it would take to provide connectivity to our trains, and two things jumped out very quickly: One is that it's very hard. The second is that it's very expensive. We also haven't really come up with a killer application that we need it for. A year and a half ago, we brought in a VPN from V-One, and we implemented it so the other 18,000 employees that don't have Internet access from work can dial in from home and see our intranet. We have about 1,200 registered users. Now we're embarking on a program where we'll be able to use the VPN to get to other systems within the company. There's some movement in the company — albeit small — for people to be able to work from home. We have a number of people testing it out now, and it seems to be working very well.

How have you ensured that your voice and data networks will be competitive from a technology point of view throughout the course of the outsourcing contract?

After two years, we can benchmark any tower of service. If we benchmark cost and quality and service levels, and find that it changed dramatically enough to make a difference, then we have the right to sit down and work through the negotiations and get the price down. Secondly, the contract is broken up. It's a seven-year contract, but it's a four-year base with three one-year renewables. And the renewables are based upon quality.

What advice would you offer to CIOs who are thinking about outsourcing their voice and data networks?

The biggest problem they will end up having is personnel issues. They're going to either be replacing a number of their employees, or their employees are going to be moving over to the new company. How many people are still working for IBM that worked for Amtrak [back in 1994]? I only know of one.

In setting up the deal, make sure you have a really good set of lawyers. Shakespeare said: "Kill all the lawyers." That's exactly what you don't want to do in this situation.

When we sat down with IBM's management, the first thing I told them is I don't want any lawyers in the room when we negotiate what the business deal is. I didn't want the lawyers to start bringing up all the detail that they have to deal with. But you've got to get to that detail. After you agree on the business deal, you need a really good set of lawyers [to finalize it]. These are generally outside counsel who specialize in this [area].

If it's a big deal, you want to get a consultant in to help you with what's the best practice in the industry. You have to have a good idea of what kind of telecom rates you should be expecting, what kind of management fees, how much things should be costing you, and what are prevalent SLAs. You may be satisfied with 98.5% [reliability], but it's good to know where the industry is. And this information isn't readily available. We used the Outsourcing Institute. We were really satisfied with them.

What concerns about your voice and data networks keep you up at night?

There aren't any, actually. We have a lot of old systems, but they run pretty well. From a reliability perspective with our network, I think we're right up with the best. It doesn't keep me up at night at all. I don't carry a pager. I don't carry a cell phone. I'm not worried about those kinds of things. I also have really good people managing the vendors, but I think the vendors put very good people in those slots. ■

Infrastructure

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Q&A

Aventail looks to best IPSec VPN vendors

Aventail has sold Secure Sockets Layer-based remote-access equipment and services for roughly six years, longer than most of its competitors. Now that the technology really seems to be catching on, the company is looking to capitalize on its head start. CEO Evan Kaplan recently spoke with Network World *Senior Editor Tim Greene about where the company and market are headed.*

How do Aventail's offerings stack up against IP Security [IPSec] VPN remote-access products?

We are the first SSL VPN to be a true, comprehensive IPSec [remote-access] replacement.

How does your gear actually match up vs. IPSec remote access?

[With IPSec, a remote PC has client software that creates an encrypted tunnel across the Internet to a VPN server, granting direct access to all the network resources behind the server.] We can take an application like Outlook and rerender it into a Web page. Or [do the same with] a standard SAP client. We can take a [Server Message Block] file system and render that into a Web-based interface that will give you whole SMB file access. We have a Java local listener that allows you to handle basically any client-server app that happened to be resident on a PC.

So you could go home without actually deploying a client and use your full Outlook client or Exchange, or you could use a SAP client that could be deployed on the desktop. You could do Windows terminal services.

And then you go to proxy-based VPNs, which are basically the full replacement of an IPSec solution, with a very simple agent as opposed to a full client.

You can beat out IPSec remote access today with your offerings?

We're 75% toward the basic functionality [we need to compete directly with IPSec VPNs]. We don't believe anybody else is that far along. [We'll] get to 95% of the functionality [by year-end], and then layer on ease of use, management, deployability and optimization.

What about site-to-site VPNs?

We will never replace site-to-site [IPSec VPNs]. Ours is a remote-access or extranet platform. Within six months we will have what we call a server-to-server component as opposed to site-to-site. That's already in our product plan.

There are a lot of younger companies in SSL remote access. How do you rank them?

The people who I lose sleep over at night are the bigger players ... Cisco or Check Point or Nortel. Check Point and Nortel have entered and we expect Cisco to enter the market sometime in the next 18 months.

I ask about the start-ups, and you mention the big network vendors. Why?

If the [big network vendors] pay attention to [developing good technology], they have distribution [channels that will have an impact]. Not technology, they have distribution.

See Aventail, page 18

Short Takes

■ **Microsoft** says the next update to its Windows CE .Net operating system, code-named McKendric, will ship by midyear and include new features. Expected to be called **Windows CE .Net Version 4.2**, McKendric offers several improvements over the current operating system version, Windows CE .Net 4.1. It will incorporate support for voice over IP, a firewall and wireless network support for residential gateways, Microsoft says. Version 4.2 also will make APIs more compatible with software developed for PDAs running Microsoft's Pocket PC software and other devices running on Windows CE .Net. McKendric will include a sample VoIP application when it ships and offer a proxy client that will let VoIP applications be used through firewalls. www.microsoft.com

Egenera blades target data centers

■ **BY PHIL HOCHMUTH**

MARLBOROUGH, MASS. — The goal at Egenera, an emerging blade server company, is to help big corporations — particularly well-known Wall Street firms — shrink their large, multiserver data centers so they can be managed less expensively and operate faster.

To do this, 3-year-old Egenera has developed its BladeFrame chassis, which is aimed at consolidating many Linux-based servers into one box and letting servers in the chassis be configured and partitioned on the fly through software. This technology is another move toward "virtualizing" a part of a company, such as storage. In this case, data center servers are created and managed in what Egenera calls a processor-area network.

The BladeFrame system can house up to 96 high-end (up to 2 GHz) Intel processors running Linux. These CPUs can be deployed as individual systems on two- and four-way processor blades. Server configurations, applications, storage and I/O are configured through a BladeFrame management console.

Processors in the BladeFrame are connected via a 2G bit/sec proprietary interconnect technology, which provides communication between the logical servers in a rack, and also allows for server load-balancing and failover. A 10/100M bit/sec or Gigabit Ethernet connection to a LAN, and FiberChannel or SCSI connections to a SAN also are on the BladeFrame chassis.

The virtualized servers in the chassis are easier to manage, the company says, because server images can be set up and removed faster than dealing with physical hardware on individual machines.

"We use a blade form factor, but blades are really just a 1980s server form factor repackaged and a little more dense," says Deborah Miller, president and CEO of Egenera. Egenera delivers data center virtualization support today that HP, IBM and Sun plan to support in 2005 and 2006, she says.

Miller says Egenera's product differs from blade servers from vendors such as HP, Dell and IBM in that the BladeFrame processor blades are diskless — the systems work with most major SAN vendors' equipment — and that the I/O to the servers is controlled virtually through software.

"We put [Egenera] in the blade server market," says John Enck, a vice president at Gartner, "but the capabilities their product has are unique in the market ... they have quite a bit of a lead on everybody."

Enck says the ability to manipulate storage and logical server identities among processors in the BladeFrame differs from competitive server blade products. However, all of Egenera's competitors have this ability planned for future products.

While Egenera's architecture differs from its competitors, it is going after a different market than current blade servers, wh

See Egenera, page 1

TOLLY ON TECHNOLOGY

Kevin Tolly

'Trust but verify': Real products, imaginary features

Trust but verify," the cold war adage, has been invoked in many different ways over the years. Sadly, its applicability to IT goes beyond just concerns of e-mail viruses. Network executives, it would seem, have to be concerned with real products that come with imaginary features.

In recent months alone, without really looking, The Tolly Group has encountered several leading products that have come down with "imaginary feature syndrome." Here's how it has typically played out:

In the course of evaluating a product, our engineers enable or configure a service on the box, but the test results don't change. After verifying that the configuration steps were correct, we contact the vendor's product support staff. A short while later, the vendor support staff informs us that the implementation is "not yet complete." Translation: The feature doesn't exist.

I understand that software development is an ongoing affair. What bothers me — and strikes me as disingenuous on the vendors' part — is that they manage to finish enough of the development to let you *think* that the feature exists. You can click away and configure the feature — it is up to *you* to find out that it's not there. And this is not always easy.

In one instance, the test involved quality of service (QoS) for a new, high-speed LAN module. The test attempted to exercise a long-advertised QoS capability using new hardware. It didn't work.

The vendor told us that this support had not yet been ported to work with the new module. At the same time, we were informed that customers knew that. We couldn't find any such notice on the vendor's Web site. After so informing the vendor, a document miraculously appeared.

A much simpler evaluation of QoS in an IP telephone led us down the same path.

If we've learned anything about convergence these past few years, it is that latency-sensitive, real-time interactive voice needs to be prioritized above other traffic. Thus, evaluating QoS tagging on voice-over-IP (VoIP) endpoints is a basic, essential task.

During a test, our engineer dutifully was exercising the system's ability to set any one of multiple priority levels on the phone's VoIP traffic stream. But, when we pulled up the actual network traffic on the trace, something wasn't right. No matter how we configured the priority on the graphical user interface (GUI), packet priority remained *zero*.

After verifying that our network analyzer wasn't at fault, we contacted the vendor, which quickly acknowledged that this feature was implemented only partially. Again, the vendor managed to implement the part that lets you think the feature exists but hadn't gotten around to setting the proper bits in the packet. Nor had the vendor bothered to update the message on the GUI to remind network managers that while they could configure the feature, the phones did not yet support it. Simple oversight.

So why does this happen?

Often, it is the drive to be "first to market" combined with the mostly accurate observation that while network managers will buy a product because of its bleeding-edge features, they rarely will use those features immediately. Thus, as long as the basic claim can be satisfied, many of the more subtle aspects might not be exercised for weeks or, more likely, months.

So like a good cold warrior, remember always to trust but verify.

Tolly is president of The Tolly Group, a strategic consulting and independent testing company in Manasquan, N.J. He can be reached at ktolly@tolly.com.

Q A

Aventail

continued from page 17

Is your technology so much better than the start-ups' that you don't have to worry about them so much?

I'm always supposed to say our stuff is better, but yeah, I think our stuff is a lot better. We've had six years to build it, we've run it as a service for roughly 400,000 people. It's been banged around. Every enterprise application that's out there we've come across in some way, shape or form.

Are you losing sleep over the start-ups like Neoteris, Netilla, SafeWeb and Aspelle?

No. I lose sleep over Nortel at this point. And I lose sleep over how Cisco would enter the market.

How will Cisco enter the market?

It depends. If they want to go to the level Check Point or Nortel does, they'll [develop the technology] themselves. If they want to go where we really believe the market is going — to these very software-intensive, easily deployable, highly manageable systems — they're going to have to buy someone. And that's been their pattern.

So which do you expect them to do?

One, then two. One of the things that people like us and SafeWeb will do is show the market just what you can do with software here, and to a certain extent probably Neoteris also.

Is there really enough money in SSL remote access to keep a business afloat long-term?

Remote access, given the numbers of users and the people, is probably a larger market longer-term than the market for site-to-site [IPSec VPNs], which is an amazing thing. I'll point you back to the old days in which Cisco, Bay, companies like Shiva and 3Com built a remote-access business that probably totaled $18 billion just on terminating dial-up remote access. Those users haven't gone away. Those users have actually increased. Now you've got PDAs and Wi-Fi.

Ultimately, won't this capability become a commodity that might even be added to standard PC software?

It's not a very simple network problem where I slap in a router and optimize routes over time. There's a lot of software to do this clientless stuff well. Whether it's the Java applications or the Webifiers or the proxies there are a lot of tricky and interesting things that make this a very compelling software value-added platform. If you want clientless access to client-server applications, to Java applications, to Siebel and SAP, you can't do that easily.

How does the IT slump affect Aventail?

The basic theory on this is people aren't making big investments in applications, and they aren't making big investments in infrastructure. IT guys look at solutions like ours and anybody else that competes in the same space and say, 'Listen, we can keep the same set of applications but we give broader access. It's a big win for us with a relatively low capital expenditure, right?' Somebody can get into our stuff for as little as $20,000 for the appliance side. ■

Egenera

continued from page 17

are aimed at consolidating many small servers running e-mail or other types of edge applications.

"The market we're attacking is the mission-critical, proprietary, Unix market," Egenera's Miller says.

So far, Egenera has been successful in usurping big Unix boxes at Wall Street firms. To break into this tough market, it didn't hurt that Egenera's founder and CTO, Vern Brownell, was once in the trenches of Wall Street IT as CTO of Goldman Sachs. Thus far, the company's announced customer lineup includes Goldman, Merrill Lynch and Credit Suisse First Boston (CSFB).

CSFB last year used Egenera's products to migrate its trading application off of a proprietary Unix platform based on Reduced Instruction Set Chip (RISC) architecture onto Linux and the Intel-based BladeFrame hardware. The company says it went with Egenera as way to deploy its applications on a less-expensive, more manageable platform. And along the way, it also found the BladeFrame to be faster than its Unix servers.

"The problem at CSFB was that our server population was increasing while our revenue wasn't," said Evan Bauer, CSFB's chief technologist, at LinuxWorld Expo in San Francisco last year.

Bauer said he and his staff were charged with consolidating applications and systems from seven different firms that CSFB acquired over the past four years. The catch was to do it on a constrained budget and to prove that the system would pay for itself over a short period.

"In this economy, we're not spending a nickel on anything that won't pay back within 12 to 18 months," he said.

With the Linux-based Egenera products, CSFB has seen 50% savings in terms of hardware and software costs vs. its old Unix servers. At the same time, application performance on Egenera improved, as the BladeFrame processors now average about 18% utilization vs. the RISC chips, which chugged away at nearly 100% usage in the past on the same application.

In the end, Bauer said, "we could say to our management that we brought in the [computing power] we needed, and we spent less to do it." ■

PROFILE: EGENERA

Location: Marlborough, Mass.

Founded: March 2000

Key executives: Deborah Miller, president and CEO, a former IBM vice president overseeing the AS/400 business; Vern Brownell, chairman, founder and CTO, formerly CTO at Goldman Sachs.

Employees: More than 200

Product: Egenera BladeFrame System — a chasiss holding up to 96 Intel processors for server consolidation and "data center virtualization."

Funding: More than $94 million through three rounds of venture funding from Kodiak Venture Partners, Spectrum Equity Investors, Goldman Sachs, Austin Ventures, Crosslink Capital and Lehman Brothers Venture Capital, among others.

www.nwfusion.com

More online!

Get the background on Egenera, named one of *Network World's* "10 Start-ups to Watch" in 2002.

DocFinder: 3927

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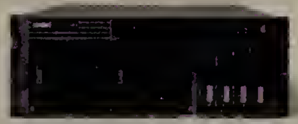

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Short Takes

■ **SAP AG** last week said it would add workforce management capabilities to its **mySAP Retail** offering. The new, Web-based package will be released in the fourth quarter of this year, the company said. A key feature of the software will be an optimization engine aimed at assisting stores with staff scheduling by balancing variables such as employee skills, payroll requirements, workplace rules and employee availability. Much of the new software's features are based on StaffWorks, a product SAP picked up in its 1999 acquisition of Campbell Software. The workforce management tools will be available as part of mySAP Retail, an offering in SAP's mySAP portfolio of Internet-connected e-business software. MySAP Retail is intended to facilitate operations such as customer service, supply-chain management and sales support. Pricing has not been announced. www.sap.com

■ **Flamenco Networks** last week announced an enterprise version of its hosted **Web Services Management Solution,** software for securing Web services. Previously, Flamenco offered the software as a service hosted either by Flamenco or a service provider that had licensed Flamenco's software. Now, companies can bring Web Services Management Solution to their networks to provide security for network traffic based on XML and Simple Object Access Protocol. WSMS is a distributed platform that consists of two primary components: a controller and a set of proxies. The controller is a Java 2 Platform Enterprise Edition application that monitors and manages Web services traffic. The proxies include handlers configured to support security services such as authentication, authorization, encryption, digital signatures and nonrepudiation. WSMS Enterprise Edition is available now with pricing starting at $100,000. www.flamenconetworks.com

Preventative action

Trend Micro packages could ease antivirus administration.

■ **BY ELLEN MESSMER**

CUPERTINO, CALIF. — Trend Micro last week unveiled a range of new services and product updates it hopes can help ease the administrative task of preventing and cleaning up after virus outbreaks.

Trend Micro is expanding its Enterprise Protection Strategy (EPS), a combination of products, services and centralized management tools that is designed to help IT managers thwart attacks from computer viruses and worms. The company introduced EPS in May.

Specifically, Trend Micro has retooled its full line of antivirus and content-filtering products to let customers manage desktop and server security policies from a central location. The new Central Management Console can be used to enforce five written policies, such as denying the right to access certain files and executables, or blocking network ports that might be deemed especially vulnerable during fast-moving virus or worm outbreaks.

Corporate customers can create customized policies as well, says Steve Quane, Trend Micro product manager for enterprise products. The goal is to automate policy enforcement, when appropriate, and gain real-time work-flow-based virus reporting and eradication when a virus outbreak occurs.

"The old model of pattern-file matching is not sufficient," Quane says, alluding to the traditional approach that antivirus vendors take of capturing a new virus specimen and fashioning a signature-based means to block and eradicate it that depends on upgrading every desktop and server using antivirus software.

Now customers can sign up for one of many support plans, depending on the size and security needs of their organization. As part of the expansion, the EPS Outbreak Prevention Services have been broadened to encompass file, Web and messaging servers running on Solaris, Linux and Windows, and users connected via broadband connections from remote offices.

Previously, the Outbreak Prevention Services program worked only for messaging servers on the Windows platform, according to Trend Micro.

The Outbreak Prevention Services distribute information on developing virus outbreaks to Trend Micro customers before the release of a virus pattern file. That information can be used to modify network configurations and prevent or reduce infection.

In addition to strengthening its prevention services, Trend announced that it is beefing up its Damage Cleanup Services which help companies recover after a virus outbreak. EPS customers now will receive attack-specific cleanup templates through the Damage Cleanup Server, which interacts with and repairs infected machines. The templates guide customers

See Trend Micro, page [illegible]

Costly virus

In an ICSA Labs survey of 300 companies, the cost of coping with virus woes averaged between $100,000 and $1 million in 2002 in terms of downtime, virus cleanup and lost productivity.

SiteScape furthers collaboration suite

■ **BY JOHN FONTANA**

MAYNARD, MASS. — A new release of SiteScape software lets companies add real-time communication support to their collaboration environment and link data collected in online meetings to discussion threads, stored documents, calendars and workflows.

SiteScape added a real-time element to its collaboration suite with the release of a Web conferencing module for its Enterprise Forum 7.0 software. The company last week shipped Forum eMeeting, which provides conferencing, whiteboard and application sharing, and voice and video over IP.

"We are really using the application sharing where users can just open [Microsoft] Word and start writing or use PowerPoint to share a presentation," says Zbigniew Ignatowicz, manager for IS for the Standards Council of Canada in Ottawa. The Council has nearly 6,000 users spread over 500 committees that voice Canada's standing on standards that cover everything from technology to agriculture. Ignatowicz will roll out the software later this month with the hopes of achieving some cost-savings and making it easier for committee members to hold meetings without having to travel.

"We expect this [real-time] communication will help us speed our processes," Ignatowicz says. He says the integrated nature of eMeetings with Enterprise Forum 7.0 also means less training will be needed, because it works within the software's standard interface.

He says the council might offer e-learning courses using the software.

The eMeetings module also provides the option of keeping their information behind their own firewalls. Late last year, SiteScape introduced integration between Enterprise Forum 7.0 and a hosted conferencing service from Placeware.

SiteScape is trying to keep pace with other collaboration vendors such as IBM/Lotus, Microsoft and eRoom Technologies, which are mixing real-time features with their traditional collaboration platforms.

"Convergence of synchronous [real-time] and asynchronous technology such as messaging is a major trend," says Lewis Ward, senior analyst for Collaborative Strategies. "The combination of the two is the Holy Grail of collaboration."

On the client side, Forum eMeeting requires use of Internet Explorer 4.01 or higher and Netscape 4.08 or higher. Forum 7.0, which runs on Windows NT or 2000, Sun Solaris and Red Hat Linux, supports Microsoft's SQL Server 2000 and Oracle 8i databases to go along with the custom database that ships with the software.

Forum eMeeting is available now and is priced at $99 per user, in addition to the $99 per-user license required for Forum 7.0.

SiteScape: www.sitescape.com

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'NET INSIDER

Scott Bradner

No Internet in here?

From the reports I've seen, attending the recent Consumer Electronics Show was not worth the pain of being in Las Vegas. When the most reported-on innovation was Bill Gates' wristwatch, you know something was missing in glitzville.

The Boston Globe's article on the show mentioned watches in passing but focused on what it called Microsoft's and Sony's "dueling visions" of control of the living room of the future. To me the visions — if they actually can be classified as "intelligent foresight" (as my dictionary defines "vision") — are virtually identical, are hardly innovative and, I hope, will turn out to be mirages created by extreme nearsightedness.

The idea that I might want Microsoft or Sony to control my living room strikes me as odd, but I'm quite sure both companies are convinced that it is my heart's desire. The picture, as painted by the *Globe*, is that Microsoft wants the PC to be the gateway (or is it police officer?) between the home and the world. Sony, as reported, wants TV to play that role.

The *Globe* spent 27 inches of newspaper column talking about this "classic battle," as one of the people interviewed put it. But the article failed to mention a more important battle — the one to let you and me control what we see and do rather than becoming programmable automatons with the controls being in the hands of Microsoft or Sony with the copyright mafia directing both of them.

Microsoft has pursued this dream — I refuse to call it a vision — for years. Realizing the model of PC-as-home-gateway/controller would lock the company into a commanding position to dictate technology directions for years to come. A few years ago, Sony seemed to have a different vision. Company executives talked about making all their company's home devices Internet-capable. Each Sony TV, VCR and DVD player could communicate over the Internet on its own. But it now looks like Sony has succumbed to the same greed-blurred view of a single-vendor-centric future.

Sony's old vision was not its alone. Sony's old vision was the Internet. You remember the Internet — that network that let the user decide what applications to run and who to talk to? The Internet is missing from the new models that Microsoft and Sony present.

In their models, they will get to decide what gets through the gateway. If they do not think an application will make them money, they will have no reason to do the work needed to support it. This model fits perfectly with the dreams of total control held by the copyright mafia. They would just as soon make sure you pay for every bit that you get over the 'Net and cannot conceive that someone might want to use the Internet for some purpose that did not include stealing their content. The ideal future in their mind is an Internet that is a Disney-controlled TiVo.

Microsoft and Sony seem eager to make that future come true. Kiss your Internet goodbye if that comes to be.

Disclaimer: As you can tell from its museums, Harvard hardly ever kisses things goodbye, but the above dark view is my own.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

Trend Micro

continued from page 21

in removing remnants of attacks, including Trojan-horse programs, registry entries and hidden user accounts that could be used to launch a new attack after an initial attack is thwarted and damaged systems repaired.

Both Outbreak Prevention Services and Damage Cleanup Services will be sold to customers as annual per-seat subscriptions that will cost between $1 and $6, depending on the number of seats, Quane says.

In selling its expanded EPS program, Trend Micro must be careful that it doesn't disparage its antivirus protection abilities while it promotes its Damage Cleanup technology.

"Anybody in the antiviral industry must walk a balance in saying 'We can not only protect you from viruses, but help you clean up once we fail to protect you,'" says John Pescatore, vice president and research director for Internet security at Gartner.

However, given that some viruses are bound to sneak onto even well-protected networks, Trend will find customers if it can prove that the effect of such outbreaks is mitigated by EPS, according to Pescatore.

Unlike chief competitors Network Associates and Symantec, Trend Micro is content to stick to its main business in antivirus and threat management, leaving it to the company's partners such as Nokia, Blue Coat Systems and smaller integrators to deliver the hardware infrastructure or professional services, according to Quane

That focus might keep Trend from falling into the same trap as its competitors. Pescatore says. "Network Associates tried to expand beyond antivirus and failed miserably. Symantec bought Axent [Technologies] to get into the enterprise space and move beyond antivirus, and you haven't seen much happen with that. Being good at selling consumer antivirus and desktop antivirus and also meeting server and gateway needs is hard to do," he says

Policy-based controls on the desktop and server are still a fairly new concept for the traditional antivirus software vendors, although a few vendors, including Okena and Harris, are tackling virus prevention through what's often known as "behavior blocking," which blocks unauthorized exploits. Corporations testing the Central Management Console for virus prevention say the underlying concept of policy-based controls is sound.

"It's an issue of awareness, because if you're an administrator and you're not actively looking at your console, you want to have a policy available," says Tony Curry, messaging administrator at Kenosha, Wis., manufacturer Snap-on Tools. The advantage in automated policy-based response would lie in being able to rapidly block attempts of fast-moving viruses and worms that attempt to exploit application vulnerabilities.

However, one potential challenge associated with Trend Micro's approach is that it requires use of Trend Micro antivirus products, so if a corporation was using several vendor antivirus products, automated policy response might be limited. Snap-on Tools uses Trend Micro for gateway-based filtering, but uses Network Associates' McAfee product on the desktop.

Paul Roberts, a correspondent with the IDG News Service, contributed to this report.

More online!

Stay on top of the latest threats to your network and get opinions and advice on battling viruses at our antivirus research center

DocFinder: 3926

Report: Data warehouse failures commonplace

■ BY DENI CONNOR

IT executives implementing data warehousing and business intelligence applications expect a failure in four of every 10 projects, a recently released study says.

A survey released by the Cutter Consortium, an IT analysis firm, says as many as 41% of data warehousing projects fail because they don't meet the business objectives of the company or because they ignore what users really need out of a data warehousing application.

Fear of failure?

Only 15% of companies using the technology claim their data warehousing efforts have been a major success.

SOURCE: THE CUTTER CONSORTIUM

A data warehouse consolidates data and information from multiple corporatewide departments. The idea is to ease resource and analysis by data mining, business intelligence, CRM or decision-support systems such as those from SAS or Cognos.

"There is no one reason for data warehousing project failure," says Cliff Hall, an analyst for the Cutter Consortium. "You see a culmination of things — customers don't meet end-user expectations, they don't have a clear view of the business problem they want to use the data warehouse for, and there are issues where the quality of the data is debatable."

Using the information in a data warehouse effectively is big business — IDC estimates that revenue from servicing CRM applications will increase at a compound annual growth rate of 25% from $61 billion in 2001 to $148 billion in 2005.

Hall says that companies are uneasy about implementing data warehousing technology — only 25% of the customers surveyed said they felt comfortable with data warehousing and 38% of the companies have brought in outside consultants to steer a stalled project back on track.

Philip Holland, a SAS technical consultant with Holland Numerics Limited, a consultancy in Royston, England, is one of those consultants. He says that the continual addition of features is the biggest cause of project failures.

"The scope of the project progressively increases over time," he says. "All the data warehousing projects I have worked on have missed deadlines due to 'scope creep.' The projects generally appear to have clear goals, but secondary goals tend to be added by senior management as new ideas emerge."

IT managers and consultants say companies can avoid problems in data warehousing projects by following several easy-to-implement rules

"A common failure is that end users really don't buy in and participate to the degree required, says Michael Davis of Basset Consulting Services. "IT folks know the technology but don't always know the business processes. The problem can be minimized if senior management buys in and frees the key end users to work on the data warehousing projects." ■

Special Focus

ENTERPRISE SOFTWARE: Portal directions.

Portal software services are growing up fast

■ BY JENNIFER MEARS

Perficient, a consulting firm in Austin, Texas, has seen great returns since it implemented its WebSphere portal about a year ago, taking advantage of collaboration capabilities to reduce travel expenses and streamline projects. Going forward, though, the company expects more than collaboration and access to content and applications from its portal.

"The portal is becoming a key part of the corporate infrastructure," says Andy Sweet, CTO at Perficient. "It's a mission-critical application."

That's an increasingly common refrain among corporate customers as they realize a portal can be more than a simple window into applications and content. With more work being done online, and especially with the advent of Web services, the portal is poised to be the new desktop where business is done.

"Portals started out as content aggregation, then became about application aggregation, now it's focusing on application and content integration," says Laura Ramos, director of enterprise portals and enterprise research at Giga Information Group. "It's no longer sufficient to have these portlet windows in the interface; the portal has to know what to do with them. So things like application integration, workflow, application development, content management, collaboration — all these things are becoming more and more important."

The idea is to have a workspace that can change according to a user's role and task, offering relevant content, applications and collaboration opportunities as a business process is accomplished, analysts say.

That notion is causing some big shifts within the portal market as vendors jockey to provide more advanced features. Consolidation has been happening in the nascent industry for some time, but the portal market is starting 2003 with a decidedly different feel from previous years: Stand-alone portal vendors are few and far between, and larger infrastructure players such as IBM, Sun and BEA Systems are refining their portal offerings.

> **"Our customers are building their own portals. What they'd really like is for us to deliver up applications and content in their portals."**
>
> **Brandon Lackey**
> Program manager, myHalliburton.com

Enterprise customers will find fewer portal vendors from which to choose this year and a rapidly maturing set of services from those vendors that remain.

In the last few months of last year, Netegrity, which jumped into the market only months before by acquiring DataChannel, opted to forgo its portal efforts. Then Vignette acquired Epicentric, one of the few remaining pure-play portal vendors.

"It's all in line with where the industry is headed, which is toward fewer and fewer vendors and toward more vendors that are going to be packaging collections of related technologies into suites," says Gene Phifer, vice president and research director at Gartner. "A traditional portal product will not have a very happy future."

Vignette's acquisition of Epicentric illustrates the trend toward one-stop products that combine collaboration, content management, knowledge management, business process management and other features, all delivered through a portal, an approach that Gartner defines as smart enterprise suites. Plumtree late last year released its content management server to help round out its offerings and plans to release a business process engine, code-named Fusion, this year.

"While enterprises are trying to alleviate the pain of integrating things themselves, capabilities that are going to be made possible by the integration of the suites are something enterprises are going to be demanding going forward," Phifer says.

Phifer also talks about an application platform suite, which is where the platform players such as IBM and Sun began, providing an application server, integration capabilities and the portal. Now, they're adding features of the smart enterprise suite on top of that, making them formidable players in the market, he says.

Looking into the crystal ball

Portal software is changing and analysts predict that 2003 will see advances that should help corporations more effectively use it.

- According to Gartner, suites of integrated software packages that contain an application server, integration software and other components will become the norm, not the exception.
- Gartner also says suites of software will become more intelligent, featuring content, knowledge and process management capabilities.
- Users can expect to see increased security, business process automation capabilities and better Web services support.
- Customers will find less proprietary implementations and more standards-based offerings, allowing for better multivendor integration.

Future features

Looking ahead over the next 12 months or so, corporate customers can expect to see features such as increased security, business process automation capabilities, more expansive Web services support and deeper customization from portal vendors. Transactions, business processes and application development will become key.

Standards are being developed to make it easier to link applications within portals. In the past, most portal vendors had proprietary portlets, application components that are embedded in the portal view.

Without standards, customers were limited to the portlets available from their vendors or faced the costly and time-consuming task of manually coding their own. Standards will eliminate those hurdles. Web Services for Remote Portals is a proposal before the Organization for the Advancement of Structured Information Standards that would enable the sharing of WSRP-compliant content and applications among disparate portals. JSR 168 is another proposed standard that defines Java application interfaces for portal applications.

Halliburton, a Houston company that provides products and services to petroleum and energy corporations, has used a Plumtree portal for about a year and a half, but looks forward to taking advantage of Web services capabilities to extend the reach of its customer-facing efforts.

"Our customers are building their own portals. What they'd really like is for us to deliver up applications and content in their portals, and now with this technology I could envision how that could happen," says Brandon Lackey, program manager of the myHalliburton.com portal. "We could continue to host the applications and the content, but from a user's perspective it would be delivered in their environment and their context."

Even before ratification of the standards, vendors were moving toward making the integration of applications and content easier. Plumtree late last year unveiled a new strategy that focuses on what it calls "The Enterprise Web," which is basically an open foundation that can combine applications and information from legacy systems, regardless of platform. IBM introduced a tool called Click-to-Action, which enables integration of portlets without help from IT.

"We're going to take Click-to-Action technology about two more stages forward in 2003," says Larry Bowden, vice president of portal solutions for IBM. "We're going to add the theme of automatic wiring so portlets can detect what information should be sent to them and what should be processed by them. So users could set up a process, save it as a template and then treat the entire process as a Web service.

"The whole idea is how do you bring a dynamic nature to the portal," he says.

That's what I want

That's what customers such as Perficient's Sweet are seeking. Sweet says he expects the portal to play a key role in how Perficient will do business, acting as the platform for business processes and application development, especially as Web services evolve. As a result, Sweet says he's particularly happy about his choice of portal vendor because IBM can provide traditional portal features, and the reliability, scalability and integration capabilities of an application server.

"This way the portal becomes part of the middleware and it's a natural part of your infrastructure, so it's easy to integrate," Sweet says.

Lackey, on the other hand, is happy with his Plumtree portal, which provides all the features he needs without being tied to a specific application server or software system.

The issue for corporate customers, analysts say, is to figure out what they want to use the portal for and then look at the different offerings. This year, they can expect lower prices, easier deployments and portals that help them get work done, rather than simply organizing content and information. ■

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ServiceProviders

■ THE INTERNET ■ EXTRANETS ■ INTEREXCHANGE AND LOCAL CARRIERS
■ WIRELESS ■ REGULATORY AFFAIRS

Short Takes

■ **AT&T** is teaming with **Toshiba's Telecommunications Systems Division** to offer small and midsize businesses managed voice and data services. Toshiba resellers are bundling AT&T Business Network voice and data services with Toshiba **Strata CTX** or **Strata DK** digital PBX systems. Customers will be able to buy local, long-distance and international voice and data services from Toshiba agents under one contract. The companies also are working to develop additional product and service bundles for businesses. **www.telecom.toshiba.com**

■ **Sprint** announced a customer win last week as **Equity One** signed up for a nationwide frame relay network. Sprint is deploying a 150-site frame relay network for the New Jersey consumer lender. Equity One, which signed a multiyear agreement, also will be using Sprint's long-distance voice services. The carrier says the deal is valued at more than $1.5 million. **www.sprint.com**

■ While it might seem as though service providers can eliminate debt only by filing for bankruptcy, **Infonet Services** has done so the old-fashioned way — by paying it off. The multinational service provider announced last week that it **paid off the last bit of its long-term bank debt,** which totaled $82 million. The company says it has $450 million in cash and assets to cover the company's business activities. Part of Infonet's cash infusion comes from a $56 million incentive payment it received this month from an outsourcing agreement. The carrier says its "on-schedule and better-than-budget performance" lead to the incentive payment from an outsourcing customer. Expect to hear more about Infonet's debt-free status as the company says it plans to play up this angle in the telecom market with customers and industry watchers. **www.infonet.com**

Broadband wireless service drawing renewed interest

■ BY MICHAEL MARTIN

Licensed broadband wireless services that provide an alternative to DSL and cable connections could become more widely available in coming months as providers shift from trialing new technology to providing commercial offerings.

Clearwire Technologies recently rolled out broadband wireless in Jacksonville, Fla. Numerous other regional players and even the regional Bell operating companies are testing next-generation broadband wireless equipment to complement and in some cases compete with DSL and cable modems.

Claudia Bacco, an analyst with TeleChoice, says it's too early to tell if next-generation broadband wireless will be a success, but she says the early signs are promising.

"We're all familiar with how the first generation of broadband wireless failed miserably," she says. "Today's generation of equipment has come a long way, but the equipment vendors are facing a lot of skepticism from the operators. People will spend more time trialing and be more cautious than they were the first time around."

Broadband wireless services competing with cable and DSL are based on multichannel multipoint distribution service (MMDS). The technology has existed for several years. Nationally, WorldCom holds about 60% of the licenses available for MMDS spectrum, followed by Sprint and a host of smaller companies.

The first generation of MMDS technology stalled in 2001 when it became obvious to providers that they couldn't make money from the service. First-generation technology required an unobstructed line of sight between an end user and a local transmission tower. First-generation MMDS also required providers to install dishes on end-user buildings, which required a visit from the provider's service technicians.

Sprint and WorldCom stopped adding broadband wireless customers, saying they would wait to assess next-generation broadband wireless gear before moving forward.

The next generation of MMDS equipment doesn't require a direct line of sight between users and nearby transmission towers. Antennas compress radio waves into smaller, more concentrated beams that are able to go through trees or building walls.

Even better, next-generation gear requires no technician visits. Providers can ship users a small, portable, battery-powered modem, which the users can install through an Ethernet or USB connection.

Speeds on Clearwire's Jacksonville network range up to 1.5M bit/sec downstream and 768K bit/sec upstream says Jeff Mucci, Clearwire's senior vice president of sales and marketing.

Speeds can vary depending on the distance from an antenna and overall traffic on the network.

Clearwire offers a variety of plans, ranging from a residential product for $50 per month to a high-end business service [illegible] $240 per month. Low-end services [illegible]

See Wireless, page

Boosting broadband wireless

Several providers, including small regional players, RBOCs and interexchange carriers, are offering or trialing DSL and cable-like services.

Provider	Market	Status
Clearwire	Jacksonville, Fla.	Offering service in Jacksonville. Planning more markets in future.
BellSouth	Daytona, Fla.	Testing with 100 customers.
Sprint	Houston, Montreal	Evaluating equipment.
Verizon	Fairfax, Va.	Testing with Verizon employees.

Broadwing may sell its broadband division

■ BY DENISE PAPPALARDO

CINCINNATI — Broadwing Communications, which once touted liquid bandwidth and optical networks as keys to success, now spends a large amount of time talking about debt reduction and zero-cash burn.

Broadwing, Inc., the parent company of Broadwing Communications, has been restructuring its broadband services arm since October. However, layoffs totaling 500 and the sale of its wholesale voice business have not been enough to stop the bleeding. This has led Broadwing to consider three options: selling the broadband business, restructuring the company's debt or bankruptcy.

Broadwing has moved on the first two fronts, and the third remains a distinct possibility.

"This management team has done everything in its power to avoid bankruptcy," says Tom Oshea, chief of staff at Broadwing. "Many people have asked us, 'Why don't you just declare bankruptcy and wipe out your debt?' Well, we don't do business that way."

The costs incurred when building out its switched optical network, based entirely on new gear and fiber, turned out to be more than the company could bear in today's business climate. While Broadwing believes its broadband unit is a valuable asset, Wall Street's opinion differs.

While the company last week announced that it's exploring all options, it did confirm that Lehman Brothers is "shopping around" Broadwing Communications to potential buyers. But Broadwing is selling in a depressed telecom market where some analysts have been frowning on the company's services because of concerns

See Broadwing, page 28

EYE ON THE CARRIERS

Johna Till Johnson

A few tips for getting accurate carrier bills

One of the pleasures of writing a weekly column is the opportunity for useful dialogue with readers. One wrote recently regarding my New Years' resolution column:

"You write: 'Make accurate bills the carrier's responsibility,' but as a company with $600 million in revenue and 3,000-plus employees, the quantity of bills that come in is overwhelming. We have locations in many parts of the world, so we have bills from AT&T, BellSouth, Southwestern Bell, SBC Ameritech, MCI/WorldCom, British Telecom, SingTel, etc.

"My problem is we have a hard time telling what's real. Recently we caught a bill for another company's long-distance. Our accounts payable was paying it because it was addressed to us. I just happened to be in the accounts-payable area for a different reason and the bill was brought to my attention. I have a hard time getting the carriers to fix problems when we find them.

"Do you have suggestions on how to act on your New Year's resolution?"

This is a common problem. Unfortunately, there's no way of solving it completely, but here are some suggestions:

- Your telecom contract contains language stating "payment due within 30 days of receipt of invoice," or words to that effect. Next time you re-up, insert the word "accurate" before the word invoice — and have your lawyers provide the legal-eagle lingo that means "accurate is defined as addressed correctly, regarding circuits that actually exist, and services we actually used that performed within an acceptable window of our service-level agreements [SLA]." This won't make the bills any more accurate, but it will give you a legal ground for the next few items.
- Stipulate that your company will make payments of contested invoices to an escrow account. The carrier will be informed that the invoices are contested, and perhaps (if you're feeling generous) of the reason why. Once payments have been made to that account, the funds will be made available to the carrier only after it demonstrates to your satisfaction that the bills are accurate.
- Provide your accounts payable department with simple guidelines about when payments should be made to the escrow account. Checking against a list of known corporate addresses is one. Bills outside a certain historical range should be another (if your Hong Kong affiliate offices typically run at $1,000 per month but last month zoomed to $10,000 — that's probably a clue.)

Also tell your network managers and network operations center to report any massive deviations from the SLA to accounts payable. Make payments to the escrow account from that point on until the service provider has proven to your satisfaction that it's fixed the SLA issue.

- Simplify your billing as much as possible via centralized procurement. Unless there's a good reason, regional offices and business units should not be purchasing telecom services themselves — you should be handling services through headquarters.

Johnson is president and chief research officer at Nemertes Research, a technology research firm. She can be reached at johna@nemertes.com

Wireless

continued from page 27

slower than the higher-priced options. The business services include multiple e-mail accounts, IP addresses and Web space.

Business service customers also get their traffic prioritized over lower-end Clearwire customers.

Clearwire might get competition from 802.11b wireless network providers such as Cometa Networks, the company formed last year by IBM, Intel and AT&T to build a wireless national network, Mucci says.

However, because Clearwire operates in licensed spectrum, unlike Cometa, Clearwire gets less interference, longer distances and better security than 802.11b networks, he says. MMDS can reach 20 miles from a base station. Most Wi-Fi equipment has a range of only several hundred feet, although more powerful equipment can extend the range 10 miles or more.

Overall, Mucci says 802.11b will be more of a complement to broadband wireless networks.

"Next year we hope to have a dual-mode transmit/receive device that can operate on our network as well as on an 802.11b network, so our users can roam seamlessly outside our footprint to public hotspot areas," he says.

Clearwire, which owns 2.5-GHz licenses in several markets, plans to expand its service to other cities. Clearwire also owns spectrum in Dallas and Buffalo, N.Y.

While Clearwire and other regional players move ahead with broadband wireless plans, the ultimate success of broadband wireless could depend on what Sprint and WorldCom do with their licensed spectrum. With WorldCom still mired in bankruptcy, it's unclear what will happen to the company's MMDS licenses. Sprint is trialing next-generation MMDS gear from equipment providers Navini and IPWireless.

MMDS isn't the only wireless broadband technology that's set to take off, says Jon Hambidge, senior director of marketing for IPWireless.

Several large PCS providers are looking to deploy IPWireless gear at the upper end of the PCS spectrum — 1.9 GHz — to give users better bandwidth than what they get from existing 1xRTT, 2.5G PCS networks. 1xRTT promises speeds of up to 144K bit/sec, but actual throughput is much lower.

"You could see someone deploy this in the PCS spectrum on a national level before you see anyone do anything in the 2.5-GHz [MMDS] band nationally," Hambidge says. Also, he notes that the U.S. government recently licensed off spectrum in the 700-MHz band and IPWireless has been talking to some of the auction winners about potential deployments.

Networks in any of the three bands would use the same equipment, Hambidge says. The only difference would be the spectrum they operated on.■

More online!

See why one research firm is predicting a wireless LAN "last mile" boom.

DocFinder: 3928

Broadwing

continued from page 27

about the effect workforce cuts might have on service.

"There was a lot of appeal for Broadwing services when they were first launched," says Counse Broders, an analyst with Current Analysis. "But we've been down on their IP services for a while because of their downsizing."

The company is aware of the market, which is why it is trying to make the unit more attractive to an acquirer.

Through staff and capital expenditure cuts and the divestiture of some business lines, Broadwing is attempting to reduce its need for cash beyond its revenue to zero by mid-2003. In the third quarter of 2002 Broadwing used $39 million in cash beyond its revenues to run its business. This is cash that came from sister subsidiary Cincinnati Bell and would have been added to the parent company's bottom line.

Analysts have a tough time speculating who would or could buy Broadwing. Names that come up include Level 3 Communications, which recently announced the acquisition of Genuity after the latter filed for bankruptcy.

"It's hard to figure out who has enough cash and the need for additional capacity," Broders says.

Broadwing says its search for a suitor has been "positive."

Broadwing also is renegotiating its debt to "refinance" the $2.5 billion that will come due in 2003 and 2004. If Broadwing successfully renegotiates this debt, Goldman Sachs says it will invest $350 million in the company.

"This is a delicate dance," says David Rohde, an analyst at TechCaliber. "The problem with the Goldman Sachs investment is, when Broadwing can prove it no longer needs the money, that's when [Goldman Sachs] will give it new money."

The company's debt reorganization is essential for keeping Broadwing out of bankruptcy proceedings. While the service provider is "confident" that negotiations are going well with its banks, "nothing is guaranteed," Oshea says.

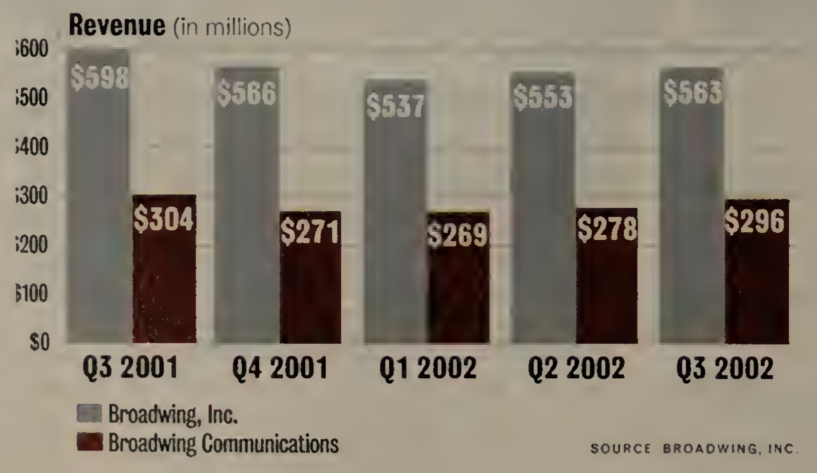
"Banks are in the business of loaning money, not pushing businesses into bankruptcy," he says.

But bankruptcy seems imminent if the carrier cannot stretch out some of its debt. If Broadwing defaults on some of its notes, the company will be forced to file for bankruptcy.

"The best outcome for users would be a debt restructuring," Rohde says. If the company does sell Broadwing, then the hope is that the buyer has enough sense to leave it alone," he says. The company has good services, especially its MultiConnect offering, and it has a decent business customer base, he adds.■

Revenue split

Even though Broadwing Communications, the broadband services arm of Broadwing, Inc., brought in 50% or more of the parent company's revenue in four out of the last five quarters, it now is being shopped around.



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■ PRODUCTS, SERVICES AND STRATEGIES FOR TYING TELEWORKERS TO THE ENTERPRISE

Linksys debuts low-cost NAS server

For small-office file sharing and added storage, this 'turn on and forget' box is tough to beat.

■ **BY JAMES GASKIN, NETWORK WORLD GLOBAL TEST ALLIANCE**

NetworkWorld Review

Fortune cookies say a man with two watches never really knows the time. Similarly, an office with two PCs is never sure where its files are until it shares storage space.

But moving up to a traditional file server running a network operating system means a big price tag and new management chores. An alternative is Linksys' new EFG80 EtherFast Instant GigaDrive, a network-attached storage (NAS) device. This entry-level file server provides 80G bytes of shared storage, password-protected directories, a print server, and 10Base-T and 100Base-T support.

Priced at about $500, the device costs more than adding a comparable hard disk to an existing PC. However, the EFG80 offers justifications for adding storage this way.

First, although sharing hard disks between Windows desktops is less expensive, the method offers weaker performance and security. The EFG80 runs an embedded Linux operating system so it can support more users than any Windows nonserver desktop system. Adding users, passwords and private directories forces better security than the Windows "share everything" mode often used by default. Moreover, leaving the EFG80 running and always available is no problem.

Second, the EFG80 is expandable, offering space for another hard disk up to 120G bytes. You also can replace the existing 80G-byte drive with a 120G-byte model, increasing the storage to 240G bytes.

Finally, the EFG80 includes a Dynamic Host Configuration Protocol (DHCP) server, so it can allocate IP addresses to all the PCs on your LAN. But your Internet router likely offers DHCP services, your DSL or broadband cable provider cannot reconfigure or crash the EFG80. Connections all revolve around Windows peer-to-peer network protocols, particularly the Workgroup networking used in small networks. Unlike some other NAS devices, the EFG80 doesn't support Macintosh clients directly, but they can gain access to files through Web access or FTP. Linux systems can make connections using built-in Windows network tools.

Installation is quick and easy, and you can attach the EFG80 to a single PC for an external disk (an expensive disk-adding option, but faster with Ethernet than the USB 1.0 options) or put it on your LAN by linking it to a wiring hub, assuming you have a network with TCP/IP enabled on your computers. Linksys includes a CD-ROM disk with a setup wizard, and a well-illustrated manual that stresses the importance of backing up files beforehand to prevent data loss.

Administration is straightforward. You provide the system's network name, set the time zone and decide whether to allow standard FTP access. Users can connect as "guest" users with full access to all defined disk shares, or you can add users and set aside private disk areas for each. Even the most technophobic user can set up this default level of sharing the entire disk, and setting up individual names and private directories takes only slightly more ability. Under the Advanced heading, you can set up and administer user groups.

There isn't a way to query existing servers to gather user names because this product is geared to be the first shared server on a network. The EFG80 can be configured to send e-mail alerts to two addresses when there's low disk space or drive failure. Though handy, the print server gives little control through the administration screens.

If you hang your EFG80 on the public Internet, users can connect via FTP or any Web browser. Using the browser, clients can download files but not upload. FTP allows both and also provides security by assigning FTP users to private directories.

Some improvements include Macintosh client support, control over the print queue to see and manage waiting print jobs, and utilities that help users automate a desktop back-up process to the NAS. Adding the print server and easy expansion makes this box stand out in a NAS field.

Gaskin is a technology writer in Dallas. He can be reached at readers@gaskin.com.

■ Net Results

EFG80 EtherFast Instant GigaDrive

2.75 RATING

Company: Linksys, (800) 546-5797 **Cost:** $500 to $600. **Pros:** Easy installation, expandable, good small-office alternative to file server. **Cons:** Limited control over print server.

What's the score?	EFG80
Setup & installation 30%	3
Management flexibility 30%	3
Security control & management 30%	2
Documentation 10%	3
TOTAL SCORE	2.75

Individual category scores are based on a scale of 1 to 5. **Percentages** are the weight given each category in determining the total score. ■ **Scoring Key: 5:** Exceptional showing in this category. Defines the standard of excellence) **4:** Very good showing. Although there may be room for improvement, this product was much better than the average. **3:** Average showing in this category. Product was neither especially good nor exceptionally bad. **2:** Below average. Lacked some features or lower performance than other products or than expected **1:** Consistently subpar, or lacking features being reviewed.

■ How we did it

Following the Quick Installation guide, we added the EFG80 to an existing 100Base-T Ethernet network. Windows 98 and Windows 2000 clients copied, created, modified and deleted files on the system, as did a Lycoris Desktop/LX Linux client. Clients using WS-FTP Pro from Ipswitch accessed files via FTP. A Samsung ML1210 laser printer was attached to the EFG80's printer port and used by all clients.

Global Test Alliance

■ **Gaskin** also is a member of the Network World Global Test Alliance, a cooperative of the premier reviewers in the network industry, each bringing to bear years of practical experience on every review. For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/alliance.

Short Takes

■ A majority of consumers want home healthcare electronic devices, according to a new study by Accenture, the management consulting and technology services firm. The report, **"Home Healthcare Electronics: Consumers are Ready, Willing and Able,"** found more than 80% of 4,313 consumers polled said using home healthcare devices would improve their overall health; 81% and 71% said they believe the devices would help them avoid hospital and doctor visits, respectively; and 82% said they believe the devices would help them save money. To gain such services, 61% of respondents older than 65 said they would be willing to upgrade their cable, telephone or Internet services, and 63% said they would upgrade their TVs and PCs. Fifty-one percent said they would add new services to enable these devices.

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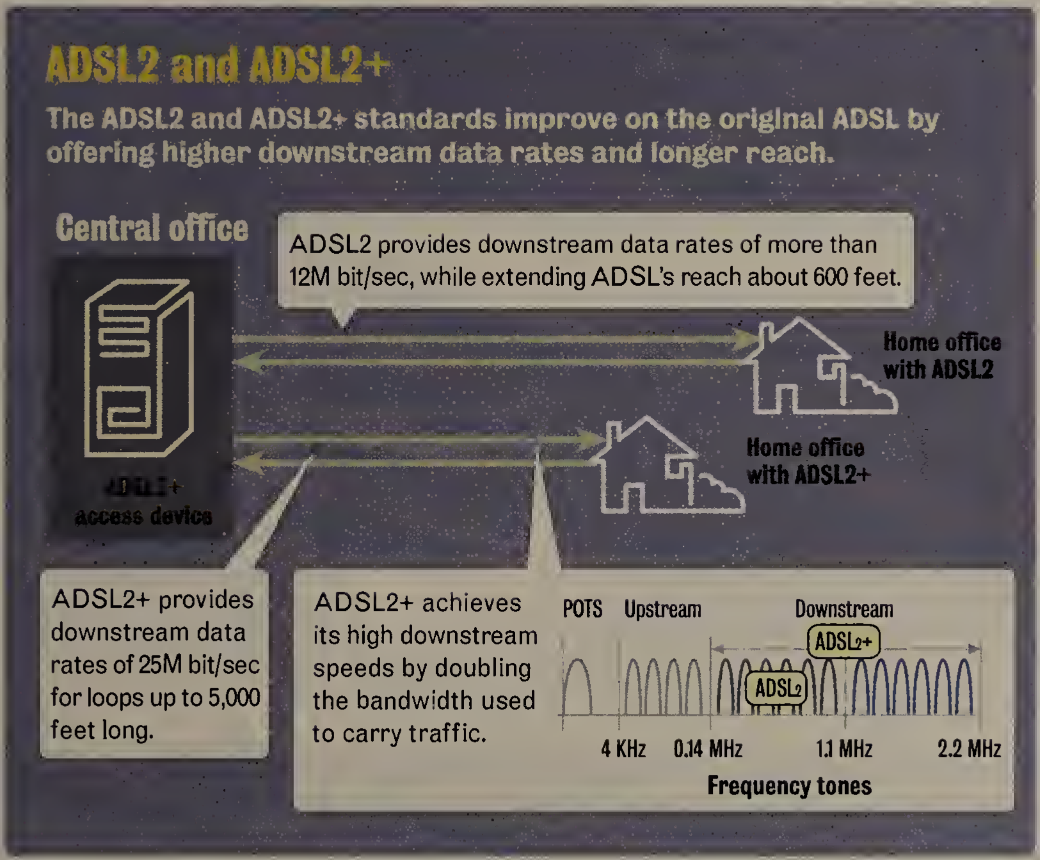
Technology Update

■ AN INSIDE LOOK AT THE
TECHNOLOGIES AND STANDARDS
SHAPING YOUR NETWORK

ADSL2 boosts data rate and reach

■ **BY PETER LEBLANC**



ADSL2 and ADSL2+

The ADSL2 and ADSL2+ standards improve on the original ADSL by offering higher downstream data rates and longer reach.

ADSL2 provides downstream data rates of more than 12M bit/sec, while extending ADSL's reach about 600 feet.

ADSL2+ provides downstream data rates of 25M bit/sec for loops up to 5,000 feet long.

ADSL2+ achieves its high downstream speeds by doubling the bandwidth used to carry traffic.

A new asymmetrical DSL2 family of standards adds features and functionality that boost ADSL's performance, improve interoperability, and support new applications, services and deployment scenarios.

The ADSL2 G.992.3 and G.992.4 standards, recently approved by the International Telecommunication Union, improve data rate and reach performance, dynamic rate adaptation and diagnostics, as well as include a power-saving standby mode. Another forthcoming standard, ADSL2+ (G.992.5), more than doubles the downstream data rate of ADSL to 25M bit/sec. The ITU expects to finalize the ADSL2+ standard this month.

ADSL2 addresses the growing demand for bandwidth to support services such as video. Forthcoming ADSL2 and ADSL2+ gear will interoperate with existing ADSL equipment, allowing carriers to roll out new high-speed services while gradually upgrading their legacy infrastructure.

Some of the enhancements ADSL2 and ADSL2+ offer include:

- **Better rate and reach:** Improved modulation efficiency reduces framing overhead, achieves higher coding gain, improves the initialization state machine, and provides enhanced signal processing algorithms. ADSL2 increases downstream data rates to more than 12M bit/sec, as compared to between 8M and 10M bit/sec for original ADSL. ADSL2 extends reach by approximately 600 feet.
- **Diagnostics:** Real-time performance-monitoring capabilities provide information regarding line quality and noise conditions at both ends of the line. Service providers can use the data to monitor the quality of the ADSL connection and prevent service failures. Carriers also can use the data to determine if a customer qualifies for higher data-rate services.
- **Channelization:** ADSL2's channelization capability provides support for Channelized Voice over DSL (CVoDSL), a method to transport derived lines of TDM voice traffic transparently over DSL. CVoDSL transports voice within the physical layer, letting derived voice channels ride over DSL bandwidth while maintaining both plain old telephone service (POTS) and high-speed Internet access.
- **Power enhancements:** Two power management modes help reduce power consumption while maintaining ADSL's always-on functionality for users.
- **Bonding for higher data rates:** The new standards support the ATM Forum's inverse multiplexing over ATM (IMA) standard developed for traditional ATM architectures. Through IMA, ADSL2 chipsets can bind two or more copper pairs in an ADSL link. The result is fiber-like data rates over existing copper lines.
- **Improved interoperability:** Modem initialization procedures are clarified, which improves interoperability and provides better performance when connecting ADSL transceivers from different chip suppliers.
- **Fast startup:** A fast start-up mode reduces initialization time from about 10 seconds to less than 3 seconds.
- **All-digital mode:** An optional mode allows for transmission of data in the POTS portion of the phone line. This adds 256K bit/sec to the upstream data rate, which can be an attractive option for businesses that have voice services on different phone lines and value the additional upstream bandwidth.
- **Packet-based services:** Packet-based services such as Ethernet can be transported over ADSL2.
- **ADSL2+:** The ADSL2+ standard doubles the maximum frequency used for downstream data transmission from 1.1 MHz to 2.2 MHz. This effectively provides downstream data rates of 25M bit/sec on phone lines as long as 5,000 feet.

Equipment supporting ADSL2 and ADSL2+ is expected to become available this year, driving the growth of ADSL and enabling new services.

LeBlanc is a member of the board of directors of DSL Forum, (www.dslforum.org), a consortium of nearly 250 businesses focused on promoting broadband DSL. He is vice president of marketing at Aware, and can be reached at pleblanc@aware.com.

Got great ideas?

■ *Network World* is looking for great ideas for future Tech Updates. If you want to contribute a primer on a specific technology, standard or protocol, contact Senior Managing Editor, Features Editor Amy Schurr (aschurr@nww.com).

Ask Dr. Internet

By Steve Blass

I'm having a problem with my ISP. My network has a cable modem connected to a firewall (WAN port), then to a switch, which connects to a Web and e-mail server. I have two public IP addresses, one for Internet and one for the Web and mail server. The firewall (3Com Office Connect Firewall DMZ) has only one media access control address. The ISP says it cannot join two IP addresses with one MAC address. Any suggestions?

With your infrastructure and ISP you would use only one public IP address attached to the firewall WAN port. You would then configure the 3Com firewall box to forward incoming Web (TCP Port 80) and e-mail (TCP Port 25) traffic to your Web/mail server on the demilitarized zone interface of your firewall box (as well as provide firewall and network address translation services for your LAN). Using both of the public IP addresses would require placing the Web/mail server between the cable modem and the firewall WAN connection. This would place the Web/mail server directly on the Internet without the benefit of firewall protection, and might not be supported by the ISP, depending on the cable modem service subscription.

Blass is a network architect at Change@work in Houston. He can be reached at dr.internet@changeatwork.com.

GEARHEAD
INSIDE THE
NETWORK
MACHINE

Mark
Gibbs

Wrapping up ASP

Well friends, this is it, the final week of our tour of Active Server Pages. Fair brings a tear to your one good eye, don't it?

In a previous column we discussed the ASP object model and its Request Object and the Request Object's Form Collection. I'm sure you won't be surprised to learn that there are a lot more objects in the model. But first, we need to explain that ASP objects have properties (attributes such as Timeout values); collections (the elements or components of the object); methods (routines that manipulate elements); and events (such as OnStart, which is invoked when the application is loaded).

We also need to mention a rather complex ASP component — the GLOBAL.ASA file. This is where you declare objects, variables and event handlers that apply to sessions or applications. There can be one and only one GLOBAL.ASA file for each virtual directory or ASP application, and it can't contain any displayable content; it can only contain scripts. In GLOBAL.ASA, you can add, examine, modify and delete elements in the StaticObjects Collection of the Application Object and create other custom objects as needed.

Here's a whirlwind tour of ASP objects:

The Application Object: This object provides access to all the files in a specific virtual directory and is the same object to all users of a given ASP application. From an ASP application you can create variables in the application object that are shared or accessible to all users of that application — they are global variables. Using the Contents Collection of the Application Object you can add, examine, modify and delete elements (variables).

The ObjectContext Object: This object is part of the Microsoft Transaction Server and lets you create transactions using ASP (operation or groups of operations that must all succeed or fail completely).

The Request Object: This object, which we discussed a few columns ago, gives access to the HTTP request from the client through the ServerVariables Collection (server environment variables), while the Cookies Collection is for (you guessed it!), cookie data.

The ClientCertificate Collection is for client-side digital certificates and client machine description, and the Form and QueryString collections are used to retrieve the client data from POST and GET requests, respectively. It has no associated events.

The Response Object: We also discussed the Response Object in a previous column. This controls the HTTP response that is returned to the client, including cookies. There are a lot of properties and methods for this object but no events and a single collection for cookies.

The Server Object: This object is a window into the Web server. The Server Object has no collections or events but it does have methods to create objects, set timeouts for script execution, map virtual paths to physical paths, encode data and create server-side components to extend server functionality.

The Session Object: A Session Object is created for and is unique to each user session. Its role is to hold information about that session. It provides persistence of user state between requests — something that isn't inherent in HTTP.

The properties of the Session Object include the code page value for the user's locale, locale information (currency formatting and date order), a session ID unique to each user (stored on the client dynamically as a cookie), the session timeout value after which the session expires, and the unique session information is disposed.

The Session Object collections include the Contents Collection (all elements added by scripts, not through the GLOBAL.ASA file) and the StaticObjects Collection, which we discussed above. This object has only one method, Abandon, which disposes of the current session information for the user session that invokes the method (no other sessions are affected).

The Microsoft Internet Information Server system also includes installable objects such as the ActiveX Data Object, which provides database access, an ad rotator (just what every site needs), a file access component and a file access component.

Well folks, that's it unless you want to get really down and dirty. Active Server Pages technology is a powerful tool for building Web applications and has even become available on non-Microsoft platforms such as Sun One Active Server Pages for Unix and Linux (see www.nwfusion.com, DocFinder: 3931).

Next week: Something completely different. Joyful cries to gearhead@gibbs.com.

Cool Tools
Quick takes
on high-tech toys
By Keith Shaw

Highlights from CES 2003

Cd3o's "stereo adapters" stream digital audio to stereos.

Broadband adoption by home users fueled the most interesting product innovation at this year's Consumer Electronics Show. If you have a home network and broadband access, vendors are coming out with products that continue to move the technology focus away from the den/office and into your living room.

I saw at least three companies with devices that scan a home network or computer for digital audio files, and play them on a home stereo system. Some devices also scan for photos and movies, and play them back on a television And then there's D-Link Systems (www.dlink.com), which launched a video phone that relies on a broadband connection.

Video phones are nothing new (AT&T demonstrated a picture phone system in 1956), but the technology has been a tough sell to consumers. D-Link's i2eye product might change that. The $300 i2eye appliance ($500 for two units) looks to bring videoconferencing quality to home users.

The i2eye device lets users conference locally or across the country over any broadband connection, and delivers the sound and images to a television screen. D-Link says i2eye includes an adjustable tilt/focus camera lens and integrated microphone. Video is streamed at up to 30 frames per second, D-Link says.

A PC is not required for setup, and the device connects via standard RCA audio/video cables. It also can be connected to a VCR to record video calls or to add to home movies. A standard telephone also can be attached to the device to help improve sound quality, D-Link says. The video phone supports the H.323 protocol for video-streaming over the Internet. The device is expected to be available in retailers by the end of this month.

D-Link's i2eye video phone lets users conference over broadband connections, and delivers the sound and images to a TV.

Audio (and more) via networks

I loved Turtle Beach's Audiotron device, which took MP3s on our computers and streamed them to our stereo system. Other vendors must love it too because they've come out with devices of their own that perform similar tasks:

- HP (www.hp.com) launched its Digital Media Receiver 5000 series. The device connects to a television and includes wireless and wired versions to link to your home network. HP adds the ability to view photos (JPG, GIF, BMP and PNG files) stored on a user's PC and watch them on TV. The device will play MP3 and WMA files, and supports M3U, PLS and RMP playlists from PC jukebox software. A remote-control device handles navigation. HP also says multiple digital media receivers can be connected, so music can be streamed throughout the house (the same song even can be played at different locations). The wired Ethernet version (en5000) costs $200, and the wireless version (ew5000, via 802.11b) will cost $300. Both devices are expected to be released in early spring, HP says.
- Cd3o (www.cd3o.com) announced a line of wired and wireless "stereo adapters" that stream digital audio to stereo systems. The c100 (Ethernet), c200 (wireless) and c300 (extended-range wireless with digital output) devices cost between $150 and $250. A remote-control device handles navigation, and an optional feature lets the adapters read back the name of the song or artist via electronic voice.
- Turtle Beach (www.tbeach.com) announced the AT200 and AT300 series of its Audiotron products. The AT200 adds wireless network connectivity, ability to connect to a TV, and expanded MP3 search and management functions. The AT300 is designed for professional custom installers, and includes features such as multizone playback, home automation and control integration. Both models are expected to ship late in the first quarter, Turtle Beach says.

There was a lot more to see at the show — head online to our CES Bonus Coverage (www.nwfusion.com, DocFinder 3929) to check it all out.

Shaw can be reached at kshaw@nww.com.

"I'm still working on that data solution." >>

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EDITORIAL

Sandra Gittlen

Getting to the heart of SLM

Getting your arms around the concept of service-level management can be tricky. Too often the tendency is to assume SLM begins and ends with the crafting of service-level agreements. But SLM takes into account how multiple components work together, and this holistic view is critical to meeting business demands.

To explore the ins and outs of SLM, *Network World* is hosting a multicity technology tour on the topic, visiting New York; Chicago; Richardson, Texas; and San Francisco beginning Feb. 4. Rick Sturm, president of Enterprise Management Associates, and I will be joined on the tour by leading SLM vendors, including Computer Associates, Compuware, HP, Metilinx, Micromuse and Smarts.

By its definition, SLM is the process of managing network services so they consistently meet client requirements. SLAs are merely the contracts that help you guarantee delivery of those services.

To develop an SLM process, you first need to understand what your client expects of you, whether that client is the end user, a whole department or a business partner. Once those expectations are known, you can start to match them with the capabilities of your network.

The resources that will be called into question include, but are not limited to, personnel, bandwidth, infrastructure, applications and budget. Do you even have the money to supply the level of service the client wants? Obviously it is important to know the answer to that question up front, but that's just the first step.

Say the client wants to roll out CRM. How do you calculate if the project will strain your staff and make it hard to live up to other service levels to which you have committed?

And if the project involves real-time multimedia or other bandwidth-intensive traffic, can your network hold up? Will the additional traffic tax other applications? Will you have to renegotiate some service contracts? Upgrade your servers? Your routers? Will you have to get new licenses for applications? Or can you make do with what you have?

Careful analysis might just show that the amount you'd spend to get your network up to speed might be better spent on outsourcing.

These considerations are just some of the many that get rolled up in a comprehensive SLM strategy. Too often the critical questions get put off until after the client is depending on you to provide service. Join the SLM conversation at a city near you.

To register for the event, visit www.nwfusion.com, DocFinder: 3932.

— Sandra Gittlen
Events Editor
sgittlen@nww.com

opinions!

Autonegotiation advice

As the principal developer of the Clause 28 autonegotiation test system/test suites within the Fast Ethernet and Gigabit Ethernet Consortiums of the University of New Hampshire's InterOperability Lab, and having been associated with the testing of every piece of autonegotiation-capable silicon since 1996, I must voice a few comments regarding Brian Tolly's column "Do you believe in the autonegotiation fairy?" (www.nwfusion.com, DocFinder: 3923).

Tolly writes: "After countless hours trying to identify the reason for the extremely low throughput, we discovered an overabundance of frame checksum errors on the counters of the questionable switch. After a clearing of the counters and subsequent runs, it was clear that we had identified our issue. What could cause these errors? A colleague of mine recommended hard coding the speed and duplex. Much to my dismay, it solved our problems."

For more than seven years, full-duplex Ethernet has existed and the issue of duplex mismatch has been omnipresent. The result of configuring one link partner to full duplex and the other to half duplex always has been catastrophic. There also is the real possibility that the vendor's drivers/firmware/software simply misconfigure the Ethernet media access control so that, though the MAC should be in half-duplex mode, it is configured to full-duplex mode (or vice versa). This is a driver/firmware/software issue and has little to do with autonegotiation.

Muddying the concept of autonegotiation with articles that are pointing out software issues, as opposed to flaws in autonegotiation, will do nothing to improve network administrators' confidence in autonegotiation — confidence that must grow as 1000Base-T rolls out and 10GBase-T emerges. Please do not simply shut off autonegotiation. Rather, contact the manufacturer, get a fixed driver, and make the world a better place for us all.

Bob Noseworthy
10-Gigabit Ethernet Consortium Manager
University of New Hampshire InterOperability Lab
Durham, N.H.

None of us believes in the autonegotiation fairy. I have all-too-frequent problems with new 10M/100M bit/sec network interface cards going into 10M/100M bit/sec switched hubs, even to the extent of no connection at all. I suspect that a few scraps of Category 3 cable still hanging around have something to do with this, although when it won't connect, I can force a 100M bit/sec connect by setting the media.

Richard Rauch
Vice president of IS
InterGroup Services
Malvern, Pa.

I work for a securities company. We too have found that autonegotiation causes performance problems and have hard coded the speed and duplex settings into our devices. Tolly does not mention why the flapping between port speeds was occurring. Is it that some vendors did not code the feature properly as the spec details? Are there any timers involved that do not match during the negotiation window?

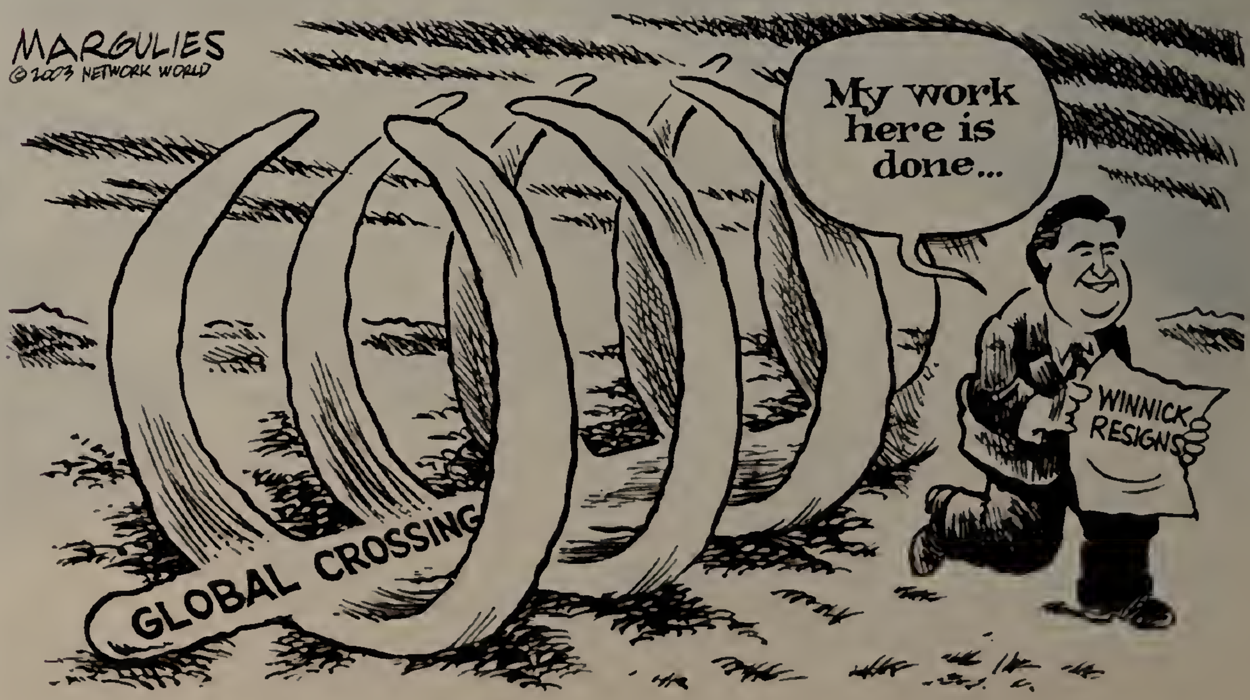
Herb Strohsahl
Brooklyn, N.Y.

Tolly responds: I am not sure where the problem lies. I have received dozens of e-mails like yours, but none from the vendor community. Vendors: Any answers?

Regarding Mr. Rauch's comments about Category 3 cable, I would not assume that this is the problem. We have seen some interesting results in our "Gigabit to the desktop" study using mangled, abused, subpar Category 5 cable. Makes us wonder if could run Fast Ethernet speeds over barbed wire!

E-mail letters to jdix@nww.com or send them to John Dix, Editor In Chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

More online! **www.nwfusion.com** Find out what readers are saying about these and other topics. **DocFinder: 3922**



PACKET EVANGELIST

Steven Taylor

Coming in 2003: Stealth frame relay

By my definition, "stealth" technologies are those that contribute significantly to service offerings without being explicitly named as such. If you asked most analysts about the success of ATM in the small office/home office and residential marketplace, they'd say it had marginal market share at best. But this same ATM technology is embedded into many asymmetrical DSL services. As such, I refer to these services as "stealth ATM."

Stealth technologies are gaining an increasingly important position in our network infrastructures. As a network professional, you are being asked to use network resources more and more efficiently. But the efficiency goes far beyond how many bits of overhead are used in a given protocol. Today, the efficiency of personnel resources also has to be considered. And because one of the most precious personnel resources is the planning time for implementing new technologies, there is considerable pressure not to use new technologies if the implementation of such technologies is personnel-intensive.

Frame relay is a great example of how we're seeing older, tried-and-true technologies being expanded and repurposed. Sure, frame relay always has excelled in bandwidth efficiency. But a major factor in frame relay's long-term success is that it's simpler than any competitive technology (other than private lines), and it works.

This repurposing is quite evident in the resurgence of interest in Multilink Frame Relay (MFR). Even though the basic technology for MFR has been around for years, the rollout of MFR services is just now starting to gain significant headway.

There are many reasons for MFR's slow start, including lack of user demand and lack of dedication on the part of service providers. But there is another, more fundamental reason: In 1999, we were still in the midst of the IP technophoria. Frame relay was viewed as old hat, so there was little interest in further development.

Today, we're seeing service rollouts of MFR in limited environments, especially internationally. But more significantly, we're also seeing frame relay as an integral underpinning of more advanced services. The most evident here is the use of MFR as the transport backbone for WorldCom's high-speed Internet access service. In this implementation, although the service is marketed as Internet access using multiple T-1 lines, the underlying technology is "old" frame relay.

Since the commercial introduction of frame relay services more than a decade ago, every year has started with somebody predicting the new year to be the last for frame relay. Having now survived onslaughts by ATM, Switched Multimegabit Data Service (anybody remember?), and IP VPNs, frame relay now enjoys a position as the grand dame of the packet-network world. In 2003, stealth frame relay will be part of the network infrastructure — whether you know it or not.

Taylor is president of Distributed Networking Associates and editor/publisher of Webtorials.com. He can be reached at taylor@webtorials.com.

Frame relay is a great example of how we're seeing older, tried-and-true technologies being expanded and repurposed.

REALITY CHECK

Thomas Nolle

Could 'open DSL' save the ISPs?

When the Telecom Act of 1996 was signed, there were more than 3,000 ISPs, a half-dozen of them major providers. Today, there are fewer than 1,000 ISPs, and it's arguable that no major ISP remains outside bankruptcy protection. Are the predatory regional Bell operating companies, seemingly preparing to take over the carrier world, eating the ISPs alive? Actually, they might unintentionally be throwing the ISPs a lifeline.

The RBOCs need to promote DSL, with or without favorable regulatory treatment. With cell phones eroding second- and even first-line voice market share, the copper loop is in danger of becoming irrelevant in voice communications. For the RBOCs, having the loop become useless is worse than having to share it via wholesaling and unbundling. So DSL is here to stay.

The issue is how DSL can make money. AOL, the largest retail provider of Internet service, is clearly no financial powerhouse, and it provides only dial-up speeds. The average price spread between AOL's service and DSL Internet access is only about $20 per month. Even assuming good economies of scale, it's hard to get the return on investment (ROI) for DSL alone to come out above 11%, and that's probably 50% too low for financial success. Moral: You've got to sell something over DSL. That's where the ISP opportunity comes in.

AOL's experience shows that the Internet alone probably can't jack up returns enough. The question is how the concept and technology of the Internet can be extended to earn more revenue.

There should be no one in the industry that knows more about the Internet, its customers and its economics than the ISPs. They should have taken the lead in developing commercial applications that would generate incremental revenue from Internet services. Instead, they sat back and counted customers while companies such as Microsoft, IBM and Cisco developed Internet applications that generated profits for them but not for the ISPs. Think about it: Practically all the so-called Internet applications, including voice on the 'Net, are based on the assumption that users pay nothing for the application except their standard Internet access fee.

The RBOC DSL positioning will give the ISPs another chance. The Federal Communications Commission clearly is going to relax unbundling rules to permit the RBOCs to accelerate DSL deployment, which will make it nearly impossible for ISPs to provision their own DSL to the user. But who cares? The ISPs should let the RBOCs figure out the technology of DSL and focus on projecting profitable services over DSL.

Most services that buyers are interested in fall into three categories: application service provider (ASP), VPN and content services. There are many hosting companies selling ASP services. Suppose an ISP packages ASP services such as Exchange hosting with VPN services and enhanced quality of service? Suppose an ISP that blocks VPN usage from residential portals sells a quality- and availability-enhanced VPN offering? Suppose an ISP creates support for interactive gaming hosting providers by offering per-game VPNs? Or maybe hosts games and other content itself?

One important step in this enrichment process is to stop trying to make the Internet the zero-cost alternative to every other kind of service. You can't charge for something you're already giving away. I can do VPNs and voice over IP on my broadband connection without paying a nickel extra. Would I pay $5 per month to keep that capability? Sure.

The trouble is that the ISPs are still living in the 1990s, when Wall Street valued an ISP by the number of customers it had and not its profit or ROI. The '90s are over, gang. ISPs have to create a profit model for their services. They have experience with the problem, at least by having experienced what doesn't work. The RBOCs have no experience at all. If the ISPs move quickly, they can gain an important lead in a critical area — profitable residential and business IP — before the RBOCs figure out how to be players in the Internet game at all.

The ISPs need to do this, because the RBOCs, like the proverbial mills of the gods, grind slowly but very fine. ISPs can be ground up, too.

Nolle is president of CIMI, a technology assessment firm in Voorhees, N.J. He can be reached at (856) 753-0004 or tnolle@cimicorp.com.

The RBOCs need to promote DSL, with or without favorable regulatory treatment.

Special Report

From Network World Fusion

Enterprise Management Associates, a leading analyst firm in the software and services industry, has developed the Network World SPECIAL REPORT based on: *Storage Solutions: A Buyer's Guide*. This SPECIAL REPORT provides guidance for IT professionals looking to purchase and implement storage solutions. The content includes a storage management tutorial and descriptions of available storage and storage management solutions. Take advantage of this free offer from Network World Fusion and secure your copy of the SPECIAL REPORT: *Storage Solutions: A Buyer's Guide* in PDF format today.

Co-authored by Michael Karp and Anne Skamarock of Enterprise Management Associates are well known in the industry, facilitating industry events and providing regular contributions in trade publications. Many storage vendors are EMA clients who provide the firm with in-depth knowledge of the products, market forces, and directions. EMA's storage analysts work with industry leaders, new technology vendors, and enterprise IT managers to help interpret, understand, and shape the direction of IT products and services.

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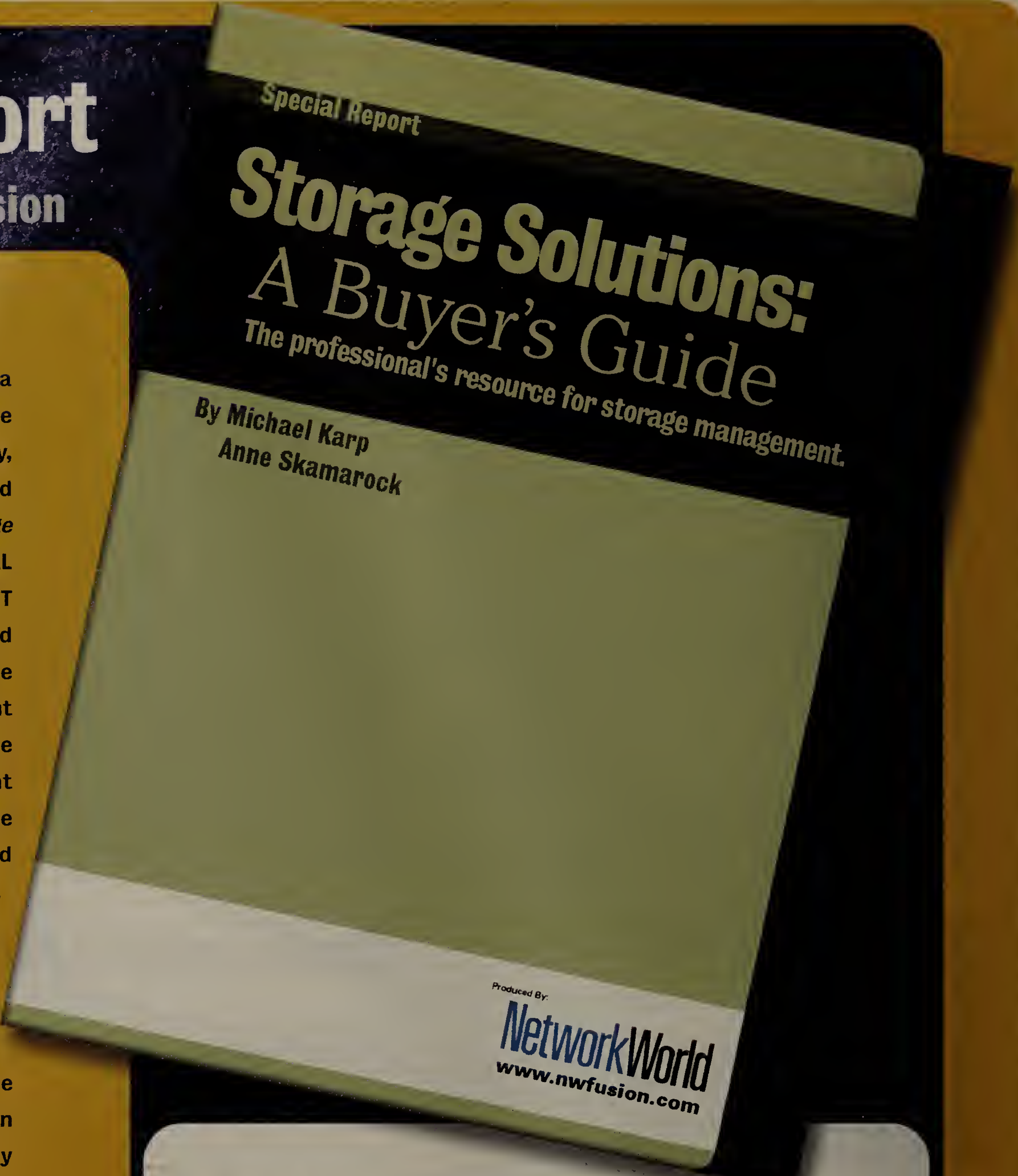

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Show planner

As 2003 kicks off, all signs point to another year of cautious IT spending. Analysts are predicting flat to modest IT spending growth among networked corporations.

However, prudent spending doesn't mean no spending. These days, network projects that solve a critical need and promise a speedy return on investment are the projects getting the green light. With budgets under scrutiny, deciding where and when to commit IT dollars is more important than ever. The ComNet Conference & Expo can help.

Show organizer IDG World Expo expects about 30,000 attendees at this year's show, which is being held Jan. 27 to 29 at the Washington Convention Center in Washington, D.C. Educational sessions, tutorials and keynote addresses will address the issues that keep IT executives up at night: old standbys such as security, systems integration and storage, along with newer technologies, such as wireless, voice over IP and Web services.

To help get the most out of your time at ComNet, we've selected some highlights from among the dozens of sessions. For more information and to register for ComNet, visit: www.comnetexpo.com/comnetexpo/V33/index.cvn.

MONDAY JANUARY 27

Pick of the day: Responding to a security threat

1 to 4 p.m.

The Computer Security Institute's 2002 Computer Crime and Security Survey found that among 503 corporations and government agencies surveyed, 90% detected computer security breaches within the last 12 months. Odds are your company will suffer a network security breach. What then? Winn Schwartau, president of security awareness consulting firm Interpact, knows the steps companies should take to survive a security incident. His tutorial covers options including establishing a hotline, deploying an internal computer incident response team, notifying law enforcement and assisting in prosecution.

TUESDAY JANUARY 28

Pick of the day: Network World's Web Services Showdown

12:45 to 2 p.m.

There's plenty of hype surrounding Web services — but straight answers are hard to find when you're trying to figure out what works and what doesn't. Look no further. Executives from BEA Systems, IBM, Microsoft and Oracle will be in the hot seats at the Web services showdown, where they will field tough, unscripted questions about their Web services strategies from analysts, each other and audience members. John Gallant, president and editorial director at *Network World*, will preside over the presidential-style, PowerPoint-free debate, along with IDC analyst Tony Picardi. Representing the vendors will be Adam Bosworth, senior vice president and chief architect of advanced development at BEA; Nei Charney, director of platform strategy group at Microsoft; Ted Farrell, architect and director of the strategy application development tools division at Oracle; and Bob Sutor, director of Web services technology at IBM.

Using multiple protection layers to provide cybersecurity

Keynote address by Daniel Mehan, assistant administrator for information services and CIO, Federal Aviation Administration

9 to 10 a.m.

Mehan is in charge of strategic IT planning across the Federal Aviation Administration (FAA) and oversees the implementation of its security, data management and process improvement programs. Last year, he directed projects including opening a computer security incident response center, bolstering the agency's intrusion-detection devices, and hardening its Internet access points. Going forward, his focus is threefold: cybersecurity, e-government, and deriving business value from IT investments in people and systems. Mehan will review the FAA's IT strategies and talk about how the agency is addressing Homeland Security.

Daniel Mehan

Doing more with less: Bandwidth optimization during budget meltdown

10:30 to 11:30 a.m.

Network links taxed? It's no wonder. WAN bandwidth requirements continue to increase as organizations consolidate data centers, deploy technologies such as voice over IP and storage over IP, and shift from client-server to Web-based applications such as those for CRM and ERP. For companies looking to rethink their bandwidth acquisition strategies, Michael Kennedy, managing partner at Network Strategy Partners, will delve into three approaches to bandwidth optimization with panelists Mike Lloyd, CTO at RouteScience Technologies; Don Templeton, vice president for customer engineering at Peribit Systems; and Todd Krautkremer, vice president of marketing at Packeteer. Each panelist will describe a technical approach to WAN bandwidth optimization and its effect on network traffic flows.

NAS virtualization: The end of NAS islands

2:30 to 3:30 p.m.

Network-attached storage (NAS) systems first cropped up in workgroup scenarios, and over time they've worked their way into enterprise data centers. Gartner expects the worldwide NAS market will grow from $1.5 billion in 2002 t $3.3 billion in 2006, sustaining an annual growth rate of 15.3%. Driving adoption NAS systems is the high capacity and performance they offer. But their ban has been the complexity of managing multiple independent NAS file servers. Michael Kazar, CTO and co-founder of Spinnaker Networks, will discuss the pr and cons of NAS management alternatives such as aggregated front ends. custom hardware, distributed lock managers and distributed file systems.

The state of intrusion detection

3:45 to 4:45 p.m.

In the first nine months of 2002, companies reported 73,359 security incidents to CERT Coordination Center. Nearly every day it seems there are stories about network attacks and system vulnerabilities. At the same time, corporations and government agencies are more dependent on the Internet to conduct business. With the stakes so high, simply relying on a firewall to control access to your network is not enough, proponents of intrusion-detection systems (IDS) say. In this session, Martin Roesch, founder and CTO of Sourcefire, will discuss ways to beef up network security, including how and when to deploy IDSs.

WEDNESDAY JANUARY 29

Pick of the day: Managing Web services: A panel discussion

10:30 to 11:30 a.m.

Corporations are warming to the idea of Web services as a means to link applications and resources across private networks and the Internet. Among 369 IT managers Gartner and The Goldman Sachs Group surveyed, two-thirds said they planned to implement Web services within 24 months. But as firms build up an arsenal of reusable Web services, managing these new and different resources becomes critical. Nathaniel Palmer, vice president and chief analyst at Delphi Group, will bring together representatives from a new crop of software companies focused specifically on Web services management. Panelists are Jim Bole, vice president of engineering at Infravio; Frank Martinez, co-founder, CTO and chairman at Blue Titan Software; and Mark Potts, CTO at Talking Blocks.

Meeting security challenges within the enterprise

Keynote presentation by John Schwarz, president and COO, Symantec

2:45 to 3:45 p.m.

A new frontier for security vendor Symantec is security information management (SIM). In a manner similar to network management software, SIM products combine data aggregation and event correlation features to bore through event logs generated from security devices such as firewalls, proxy servers, IDSs and antivirus software. IDC estimates the market for SIM products from vendors such as Symantec is set to quadruple from $15 million today to $61.3 million by 2005. In his keynote address, Schwarz will address the need for companies to have a comprehensive security strategy that incorporates early warning, integrated protection and expert response tied together with central management.

More online!

Go online for show previews, news and multimedia coverage from the show floor.

DocFinder: 3930

All about convergence

The National Convergence Summit is taking place at ComNet from Jan. 29 to 30. It's put on by the National Convergence Alliance, an association of convergence technology providers, and geared for attendees of all sorts, from public carriers to start-ups and large corporations. Sessions are designed to answer questions about the latest communication gear, who's using it and the benefits of converged networks. Plus, experts will help you decide what's best for your company: in-house equipment or managed services?

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Moving to the next-generation contact center requires two fundamental architectural shifts. You need to migrate to voice over IP, and you need to move applications to open, industry-standard architectures. Find out how in this Technology Insider.

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Goodbye ACDs, hello open servers. Automatic call distributors tied to closed-switching systems have to go. Call routing, reporting and management apps need to run on industry standard servers.

42

Goodbye TDM, hello VoIP. In order to reap the full benefits of a next-generation contact center, you need to move to a voice-over-IP network infrastructure.

NOAH JONES

■ **BY LORI BOCKLUND**

Picture this: Instead of having to operate an expensive call center tied to a physical location, you've created a virtual, multimedia contact center staffed by agents working from home or in distant offices, connected through a voice-over-IP network.

You've launched money-saving, self-service customer applications based on standards such as XML and VoiceXML that reduce the load on your agents. You've integrated your CRM software with computer-telephone integration (CTI) so that back-end database information on customers is available to agents in the form of screen pops.

Customers reach your contact center any way they wish — voice call, e-mail, chat and real-time collaboration over the Web. The customer experience is consistent across all media, and each interaction is immediately reported so updated information is available right away. The contact center blends resources, and manages and reports on all contacts via a common application suite.

Is this vision hype or reality? The answer is a little of both. This contact center is possible with today's technologies, but full-blown implementations are still few and far between. However, experts are confident that VoIP-based, multichannel contact centers are the future of customer relations, so it's important to start planning.

The next-generation contact center requires two fundamental architectural shifts. In the network infrastructure you need to shift from the TDM/PBX world to VoIP. And in the applications infrastructure you need to migrate call routing and reporting, traditionally handled by automatic call distributors (ACD), from closed switching systems to open, industry-standard servers.

Open architecture

Open architecture offers the promise of infrastructure-agnostic applications. Routing, reporting and management functions can run on a server that talks to the switching infrastructure. Open applications can seamlessly route voice calls, e-mail and Web-based contacts, and they can connect online customers with contact center agents via chat, escorted browsing or collaborative form compl[illegible] Switch vendors offering open architecture contact-center produc include Aspect, Avaya, Cisco and Nortel.

The idea is that once contact-center applications are freed from single-vendor proprietary systems, customers would be able to select best-of-breed products. This open architecture would attract a larger pool of application developers, leading to new capabilities, lower costs and improved integration.

For example, Nordea, a Swedish financial services company servicing 3 million customers and handling 44 million calls per year (85% of them automated), has deployed Genesys' Framework to transform its contact-center operation, improve the customer experience, and save more than $1.5 million per year.

Nordea migrated from the ACD applications on its Nortel switch to Genesys server-based software to manage not only phone calls, but also other media. The Genesys IP Contact Center routes contacts and integrates with Nordea's information systems and databases. And rolling the system out to additional sites was relatively quick once the initial infrastructure was in place.

Customers have the choice of which channel they want to use to reach the company, and the Genesys software funnels customers to the best available and qualified of 1,000 agents in 14 centers, considering language, product/service and customer type.

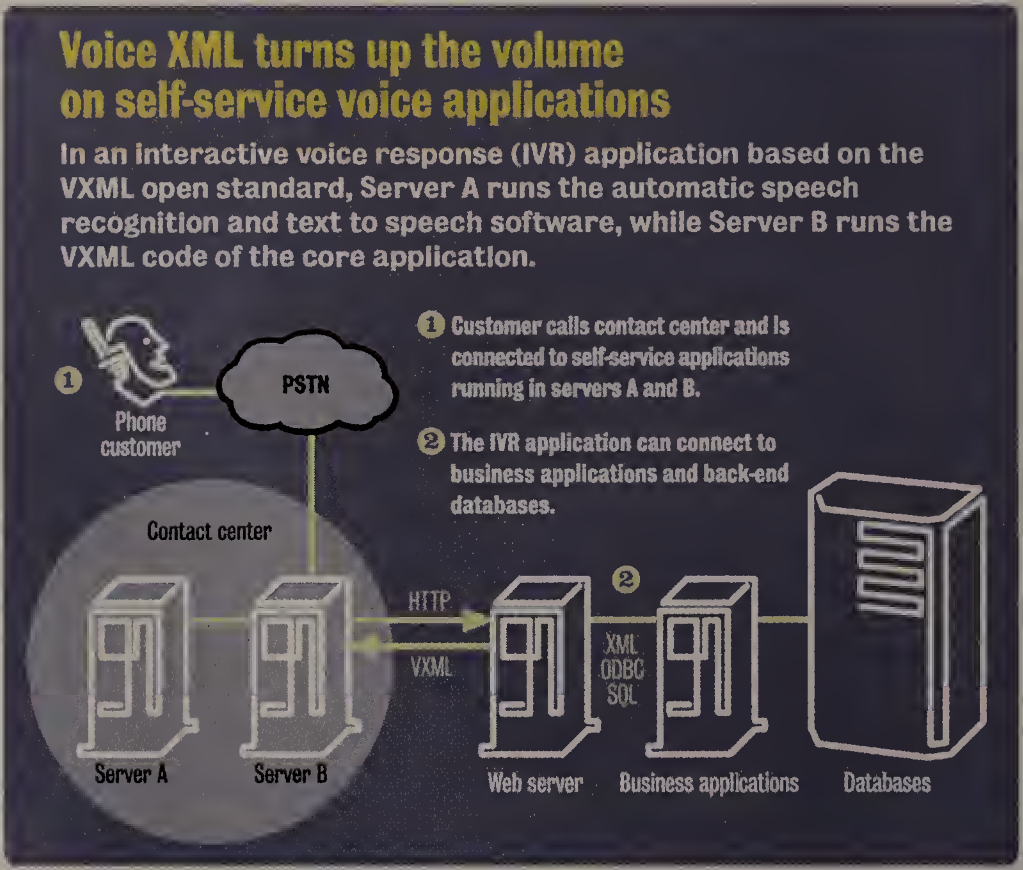
Limitations, opportunities

With an open architecture, users theoretically can mix and match products from various vendors. But that point has not been reached yet. For example, switch infrastructure vendors offer specialized applications that are tuned to their own products or they promote the pre-integrated capabilities of their server applications — tying together ACD, interactive voice response (IVR) and CTI functionality. So the world is not as "open" as it might seem.

On the plus side, customers can use standard interfaces to make integration easier. For example, APIs, such as TAPI and JTAPI, link switches to servers. CRM and CTI solutions integrate with prebuilt adapters, such as the Siemens CRM Ready Kit or the Genesys G-Plus adapters. These allow for integration with a top-tier CRM package, such as Siebel, in hours or days, rather than weeks or months. Similar connectors integrate IVR systems and reporting tools.

Other tools further the goals of openness for ease of integration, interoperability and portability. Standardized yet flexible data schemas and data access provided through SQL, Open Database Connectivity (ODBC) and XML are examples. The architecture frameworks of Java 2 Platform Enterprise Edition, .Net and Common Object Request Broker Architecture also are becoming prevalent in contact-center applications today.

Vendors have been responsive to customers' need for easy integration by offering an increasing number of connectors. Many leverage standard tools, such as ODBC; XML; and extraction, transformation and loading (ETL) applications. Faster and easier integration of the diverse elements in a center is critical to enabling efficient and effective resource management.



Voice XML turns up the volume on self-service voice applications

In an interactive voice response (IVR) application based on the VXML open standard, Server A runs the automatic speech recognition and text to speech software, while Server B runs the VXML code of the core application.

① Customer calls contact center and is connected to self-service applications running in servers A and B.

② The IVR application can connect to business applications and back-end databases.

Most vendors seeking to integrate with CRM solutions have, or will have, connectors to the top four products (Oracle, PeopleSoft, SAP, Siebel). For these vendors, there likely is a full-blown product. For others, it is an open hook — a software development kit (SDK) or API that can be written to more readily. CRM and CTI integration now is tackling the thin client architecture, which most CRM packages also are migrating to.

One example of a successful connector approach is the AT&T Headend in the Sky (HITS) implementation of Siemens CRM Ready kit with Clarify (now Amdocs). The HITS Digital Media Center services cable companies nationwide. The cable companies wanted to route contacts on open issues to the last agent who handled it if possible, and pop the trouble ticket on the screen. Siemens and AT&T integrated 60 agent desktops in one weekend, avoiding a large systems-integration effort.

Voice self-service apps go standard

Open architecture also applies to interactive voice response, where one server runs the speech processing for a natural-language user interface, and another runs the standard VoiceXML code of the core application. Both are communicating with standard voice-processing cards.

IVR vendors are supporting the VXML standard; most are or will soon be Version 2.0-compliant. This architectural change has huge potential to open the previously small pool of developers and enable portability of applications, while leveraging the Web infrastructure and common data.

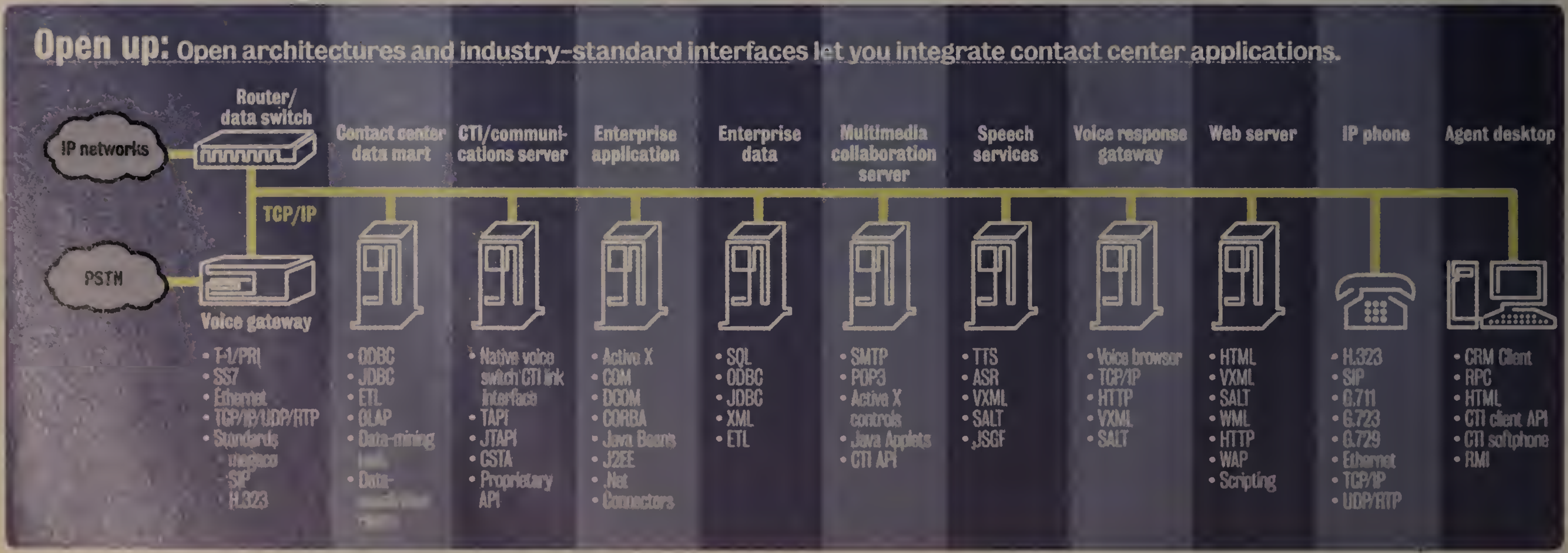
However, Version 2.0 of the VXML standard needs significant extensions to support customer contact applications. CTI-based call control, screen pops and integrated reporting are examples of functions that require capabilities beyond the standard. So a standards-compliant application might not be portable across platforms.

Many vendors generate VXML code from their proprietary graphical user interface as an option, easing the migration for those with in-house programming expertise on their current platform (but this code is not portable to a different platform if it includes any extensions). Some, such as Genesys, are agnostic about standards. They will work to promote the development of the VXML as well as Call Control XML standards. They also will comply with and support Speech Application Language Tags, a competing standard Microsoft is promoting.

Ready, set, implement?

So what's holding users back from implementing open application architectures?

- Some products aren't mature; VXML, for example, is just being used by early adopters.
- Some interfaces aren't truly open.



Open up: Open architectures and industry-standard interfaces let you integrate contact center applications.

- Not enough "canned" interfaces exist, partly because they are vendor-specific, not standards-based.
- It can be hard to integrate solution elements, potentially resulting in significant system integration costs.
- The products don't plug and play the way they're marketed.
- Not many have done it before them.
- Maintenance and ongoing management costs can be high; for example, an upgrade or new release in one element can have a ripple effect to other elements for upgrades and testing.

As a customer, you must evaluate potential costs and trade-offs in integration, problem resolution, upgrades and the like. Your strategic approach to vendor and product selection needs to consider the tradeoffs of integrating best-of-breed products vs. buying a suite of products from one vendor.

Bocklund is vice president with Vanguard Communications. She can be reached at lbocklund@van guard.net.

Take steps to open your architecture

Here's what you need to do to open your contact-center architecture to enhance applications and ease integration:

- **Understand your business strategy.** Companies that want to offer best-in-class customer service, drive down costs, or be more flexible and adaptable to changing business needs should be able to build a business case for open architectures.
- **Understand your business needs.** If you need contact handling, Web and phone self-service, improved reporting, and integration of desktop applications, it's time to look for more open solutions.
- **Develop your technology strategy.** Define where you need to be, and when, to support the identified business needs. Define how applications changes sync up with your infrastructure changes.
- **Define your design** and implementation principles. More rapid application deployment, portability, interoperability and flexibility all point to open environments.
- **Begin an education process** on the various applications and integration approaches in the contact-center market. Understand which of your strategic vendor partners are offering truly open solutions.
- **Select vendor partners** that offer open solutions. Challenge them with the "show me" question. Be clear on whether you have a best-of-breed or suite strategy and why, and understand the trade-offs that go with it.
- **Don't let low cost be a driver** unless you're looking at total cost of ownership. Understand that low-cost purchase might result in a high-cost management.
- **Deploy your new applications** through a careful testing and piloting process.

This process takes time — 12 to 18 months or more. That's why planning needs to start now.

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VoIP is in your future

■ **BY LORI BOCKLUND**

The other major architectural change on the road to contact center Nirvana is to the packet-switched world of IP from traditional, circuit-switched TDM.

The migration path generally will start with IP-enabled products, using a TDM infrastructure at the core, with IP to the desktop and IP for networking to remote locations. The next step is a full-blown IP-centric solution with an IP switching infrastructure throughout.

Voice over IP (VoIP) is compelling, and most contact centers need to start planning for it. There are three key business drivers:

Economics — Convergence of voice and data into a common infrastructure for wiring, routers, network connectivity and others holds promise. Companies will be able to deploy, manage and maintain one network to serve all communications needs, saving on infrastructure, and potentially resources, in the long term.

Applications — VoIP creates the potential for applications that couldn't have been done before, or couldn't have been done easily or effectively. This is particularly true for a multimedia and/or multisite environment, in which Web contacts, virtual operations with outsourcers overseas, and remote sites or seats, such as home agents, all could improve the customer experience. The business case for these applications also can be compelling because they save significant numbers of call center agents and prove a more cohesive reporting view of all contact handling.

Building block for the future — VoIP is an inevitable part of the contact-center infrastructure. Many centers will wait for catalysts such as major growth, a new site, time for replacement, or the need to support new applications. Or they will invest in VoIP infrastructure knowing it is the platform for the future.

"The promise and value of VoIP in the contact center is in defining an open standard that lets multiple vendor products work together," says Bern Elliot, an analyst at Gartner. "Different platforms and applications can use the same infrastructure. This in turn leads to broader choices.

"Right now, the market is pushing to get a start," he says. "The contact center lags general telephony in migration to VoIP by about two years, because it is more application-centric — and a more complex and robust application. The applications can't precede the infrastructure needed to make it possible. For VoIP to go faster in contact centers, it now needs the pull of more applications that are easier to integrate."

All major switch vendors provide IP products for contact centers. Traditional switch vendors, such as Aspect, Avaya, Nortel, Rockwell and Siemens, offer traditional TDM switches with IP phones and IP networking between sites as options in their IP-enabled or hybrid products.

They also offer IP-centric call-center products, but few call-center customers are buying them.

IP-centric players, such as Cisco and 3Com, are pushing IP-centric products, but they are aware of their limitations. They aren't trying to compete head-to-head on a feature-by-feature basis with robust ACDs, and they aren't selling much to large (more than 50 seats) mission-critical centers (yet). Cisco is positioning itself as an "ACD alternative" rather than an "ACD replacement." But the IP-centricity of these vendors means that they are further ahead in deployment of pure IP products.

VoIP is happening . . . but where?

VoIP in contact centers is happening primarily in greenfields — small or nonmission-critical centers. Some larger companies are running small pilots in the help desk for example, to gain experience with the technology. Distributed contact centers can implement VoIP in three configurations: home agents, a remote site networked off a main site, or networking multiple sites for virtual operations.

JetBlue Airways, a relative newcomer to the troubled airline industry, is delivering customer care in a different way, in addition to delivering airline travel in a different way. Using an Avaya IP-enabled product (the pure IP product was not available when JetBlue implemented more than a year ago), the majority of JetBlue's telephone customer contacts are handled by their home agents using H.323-compliant IP softphones on their PCs. Web calls to these agents are the next step.

The distributed, IP approach let JetBlue build its new contact-center capabilities quickly, minimize overhead costs, and tap into a broader pool of skilled resources. And by enabling people to work from home, they increased job satisfaction. That can translate into increased retention, productivity and customer service, which all contribute to JetBlue's bottom line.

Buca di Beppo, a fast-growing Italian restaurant chain, created a centralized call center using IP connections from its 62 restaurants. Customers dial their local number to make a reservation — any time of the day — and are routed using an IP-enabled Nortel Meridian 1, with a Symposium Call Center Server.

Customers can reach an agent at the call center even when the local restaurant isn't open, and agents interact as if they were the friendly neighborhood restaurant, thanks to the CTI integration and screen pops. The extended coverage and personalized service this product provides increased revenue more than $1 million in the first year.

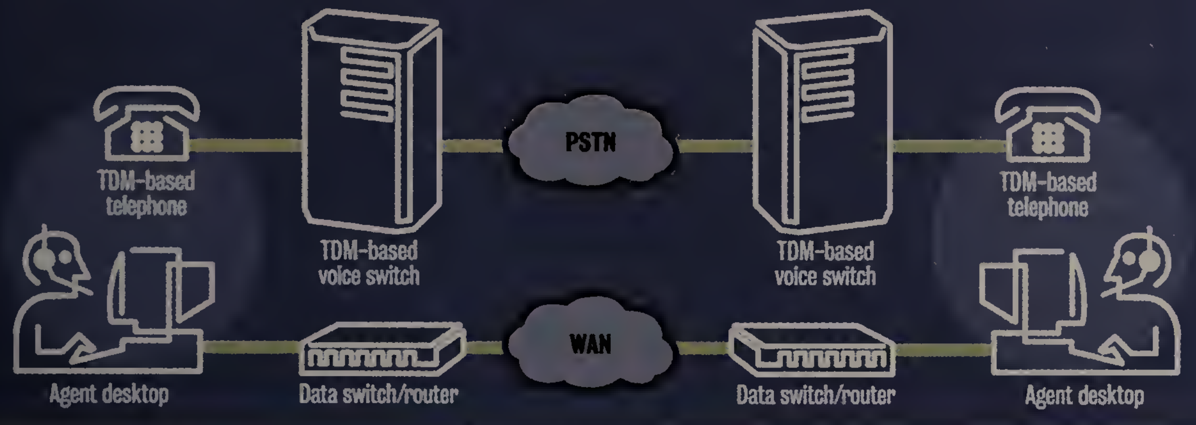
Lessons learned

The keys to success when implementing VoIP include:

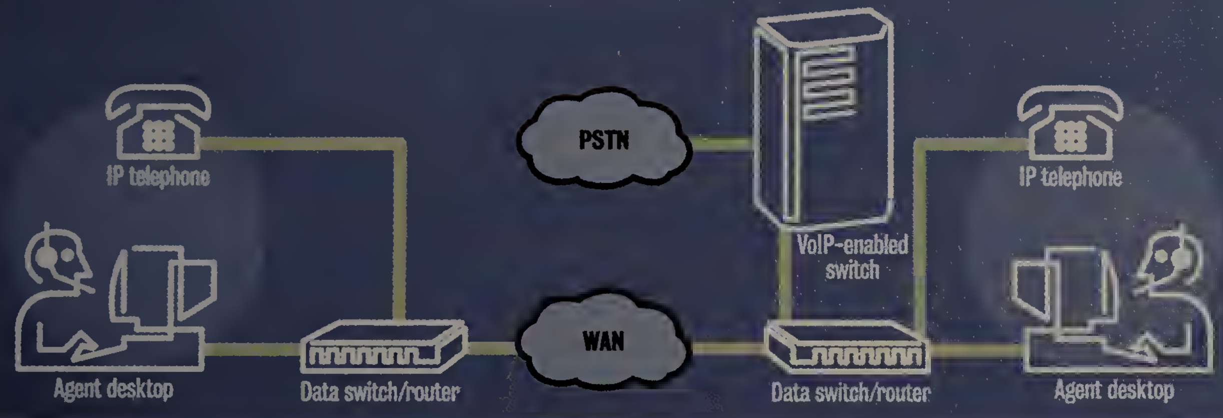
- **Define applications and business benefits. Define the reasons for migrating to VoIP.**
- **Assess and invest in network infrastructure as needed. Many vendors, such as Avaya and Siemens, offer network assessments and tools through their professional services organizations.**
- **Invest in the redundancy and reliability solutions that vendors offer.**
- **Ensure that voice and data staff work together. Collaboration is key in planning and implementation. Train and hire people with the necessary skills.**
- **Test and pilot.**

Making the leap from TDM to VoIP

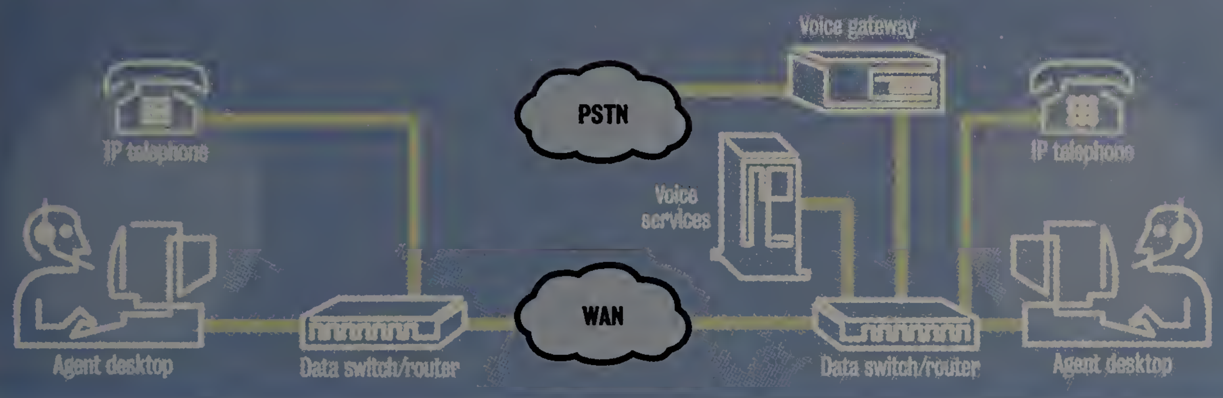
In the TDM world, agent desktop PCs connect to the WAN, and agent phones connect to the PSTN via a voice switch.



In an IP-enabled scenario, both agent PCs and IP phones connect to a data switch/router, which directs traffic to either the PSTN, via a VoIP-enabled switch, or to the WAN.



In an IP-centric architecture, the agent PC and IP phone connect to a data switch/router that is linked to voice-service applications. Traffic is sent to the PSTN via a voice gateway.



Many multinational companies also have "follow the sun" routing to centers around the globe, some managed and staffed by outsourcers. By creating a virtual center environment, they use resources effectively, deliver better service, and manage a single system for routing and reports.

Some companies are using IP to connect to remote sites, especially in countries such as India and the Philippines. Voice traffic can be compressed, furthering IP's significant cost savings on international trunking. Companies implementing these types of remote or multisite configurations also enhance their business continuity and disaster-recovery options.

Shurgard, a storage company, was an early adopter of IP, using Aspect's IPContact Server (IPCS). Shurgard needed to upgrade or replace its dated system, so it implemented a pure IP solution about a year ago. It started slowly, with a few seats in customer service as a pilot, and has begun to gradually roll it out to other applications, including 40 sales agents.

Kris Larson, sales center IT manager for Shurgard, says the company will integrate with IP switches to transfer calls to stores all over the country, support multimedia customer contact, and reap the benefits of toll bypass with its VoIP implementation. Soon it will integrate the IPCS with its IVR and other systems.

Larson says the transition wasn't easy: not only was the architecture different, but users had to adjust to a different set of reports and routing tools. Having a background in IT and telecom, and a fair amount of autonomy, helped him manage the transition.

A word of advice from Larson: "Don't skimp on the network infrastructure." Shurgard bought new network switches, routers, and servers as a lead-in to its implementation, he says.

Overcoming fear, uncertainty and doubt

So what's holding other companies back? Fears include reliability of the IP network, or of standard servers and operating systems running mission-critical applications. Additional concerns about scalability and quality remain.

However, vendors says those issues can be addressed. Lawrence Byrd, convergence strategist for Avaya, says that more than half the software in the voice switching infrastructure (whether the Definity or S8700) is for reliability, redundancy, self monitoring and healing. "And, the VoIP pioneers have learned that through proper engineering, testing and piloting, the network can be made VoIP-ready and stable."

Certainly the economy is another factor. When your workhorse PBX or ACD isn't depreciated, functions well, and provides the applications you need, it's hard to argue for an architectural change at significant cost.

One other intangible fear that affects VoIP decisions is the fear of change. Changes to organizations, roles, responsibilities and processes will accompany VoIP. Turf battles might wage between IT and telecom. Telecom staff need to shift their thinking and embrace IP (not to mention open architectures), and IT staff need to understand the network demands, as well as quality and reliability expectations, of the contact center's mission-critical applications.

In tackling all these issues, most companies will make a gradual migration to VoIP, rather than a leap. As Don Greco, director of National Call Center Field Marketing and Sales for Siemens, says, "The migration path is the most important thing to contact-center customers today. Few want to implement full IP just yet. They want to understand the migration path and know that what they are buying today will enable an 'easy' transition to IP. Many are investing in IP phones with a TDM system. They're taking the time to understand how they will move to full IP when they're ready, and when they feel comfortable with the stability and reliability IP provides."

Take steps to migrate to VoIP

Gartner doesn't "expect wide-scale adoption of VoIP by mission-critical mainstream call centers until 2005-2006" because migration to VoIP takes time, and the planning should begin now.

Your steps to migration include some of the same things you must consider for opening up your architecture. You should consider them together. Start with business strategy, understand business needs and develop a technology strategy. Take time to get educated and select appropriate vendor partners — again considering the best of breed (one vendor provides applications and another provides the IP switching) vs. suite of products (a single vendor to provide it all). Start small, and build gradually. Moving slowly into the IP waters is a sound approach, and it will enable you to then wade in deeper and deeper as the waters warm up. ■

Four-step program

Here are the top contact-center technology changes to plan for in the next one to two years:

- **Migrate to VoIP — Includes associated changes to IVR, computer telephony integration, quality monitoring or other tools that integrate with your voice channel.**
- **Migrate your contact routing, management and reporting to a server-based product.**
- **Migrate your voice self-service applications to a VoiceXML or SALT-based architecture.**
- **Integrate the routing, management and reporting for all media on a common technology infrastructure.**

Management Strategies

- CAREER DEVELOPMENT
- PROJECT MANAGEMENT
- BUSINESS JUSTIFICATION

Natural-born entrepreneurs

IT executives commercialize tools they developed on the job for previous employers.

BY LINDA LEUNG

After successfully developing and implementing a handheld route-accounting application for Millstone Coffee's delivery drivers, Kirk Wolfe was set to take another job at parent company Procter & Gamble. But Wolfe didn't want to give up the application that had consumed much of his life for five years, so he resigned to focus on developing similar software for smaller grocery suppliers.

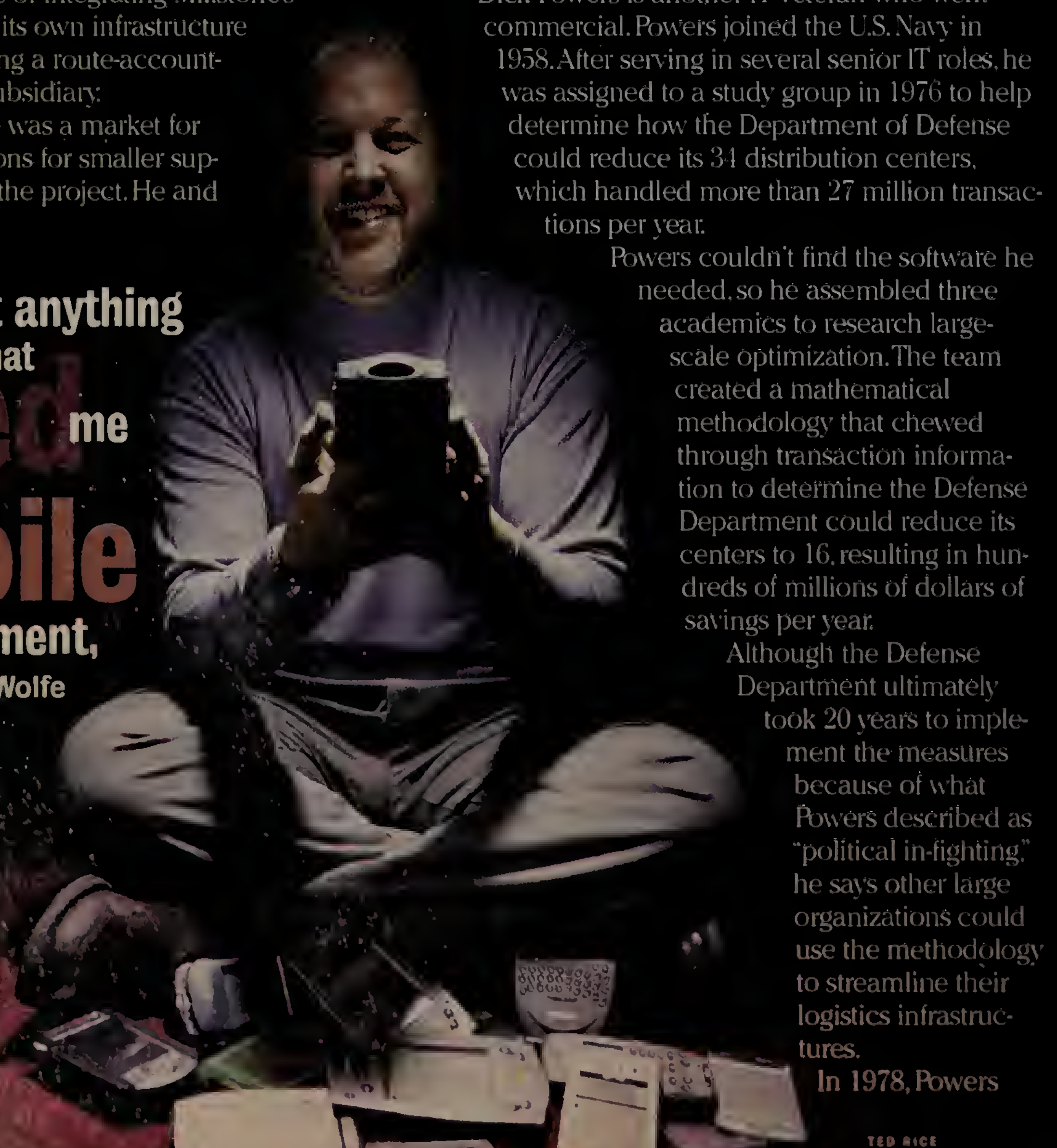
"There wasn't anything else that enticed me as much as the mobile environment," Wolfe says.

Wolfe is just one of several former IT professionals who have become vendors by parlaying something they developed in their previous roles into commercial products.

Although Wolfe knew that eventually he would run his own business, the idea didn't crystallize until he discovered his mobile software niche. When P&G acquired Millstone Coffee in 1996, the consumer products giant put Wolfe in charge of integrating Millstone's mobile application with its own infrastructure and eventually developing a route-accounting application for the subsidiary.

Wolfe discovered there was a market for similar mobile applications for smaller suppliers while working on the project. He and Phil Lachmann, a contractor assigned to the Millstone project, formed Enterprise Mobility in 1999. Wolfe joined the venture full-time in 2001 after deciding not to transfer within P&G. The two used their knowledge and experience to develop the EMRoute product.

Dave Ziegler, Millstone's IT manager and Wolfe's former manager, says his employee's departure was a "bittersweet moment." But he says Millstone benefits because it can outsource programming projects to Enterprise Mobility.



"There wasn't anything else that enticed me as much as the mobile environment,"
– Kirk Wolfe

TED RICE

Dick Powers is another IT veteran who went commercial. Powers joined the U.S. Navy in 1958. After serving in several senior IT roles, he was assigned to a study group in 1976 to help determine how the Department of Defense could reduce its 34 distribution centers, which handled more than 27 million transactions per year.

Powers couldn't find the software he needed, so he assembled three academics to research large-scale optimization. The team created a mathematical methodology that chewed through transaction information to determine the Defense Department could reduce its centers to 16, resulting in hundreds of millions of dollars of savings per year.

Although the Defense Department ultimately took 20 years to implement the measures because of what Powers described as "political in-fighting," he says other large organizations could use the methodology to streamline their logistics infrastructures.

In 1978, Powers and the three academics each put up $10,000 to form Insight and develop the Strategic Analysis of Integrated Logistics Systems logistics modeling tool.

Powers says the challenge of starting a business is educating the market and winning customers. "That's the hardest part — getting someone to have faith in you," he says. Powers and his co-founders eventually landed deals with Baxter Healthcare, Mars and Nestle.

Wolfe has found the most time-consuming aspect of running a business is sales and marketing. Recently, Wolfe partnered with a warehouse management software supplier to sell to a prospective customer. Wolfe was confident he'd win the deal until the customer's warehouse manager vetoed the sale because the PDA that supports the application used a stylus and end users were accustomed to a full-size keyboard. "We were not prepared for that aspect — being tossed out for things like that," Wolfe says. "You can have good technology, but there is a certain amount of sales and marketing that goes with it."

Chris Edden is another user-turned-vendor who was surprised at the effort involved in promoting a product. A former vice president of IS at Wachovia Bank, Edden is now business development director at Silas Technologies. Wachovia formed Silas in 1999 to market Reveille, an applications monitoring tool that Edden's IS team built to use in-house. "It was interesting for me an IT guy of 20 years, to find myself in a two-hour meeting to come up with an ad campaign," he says.

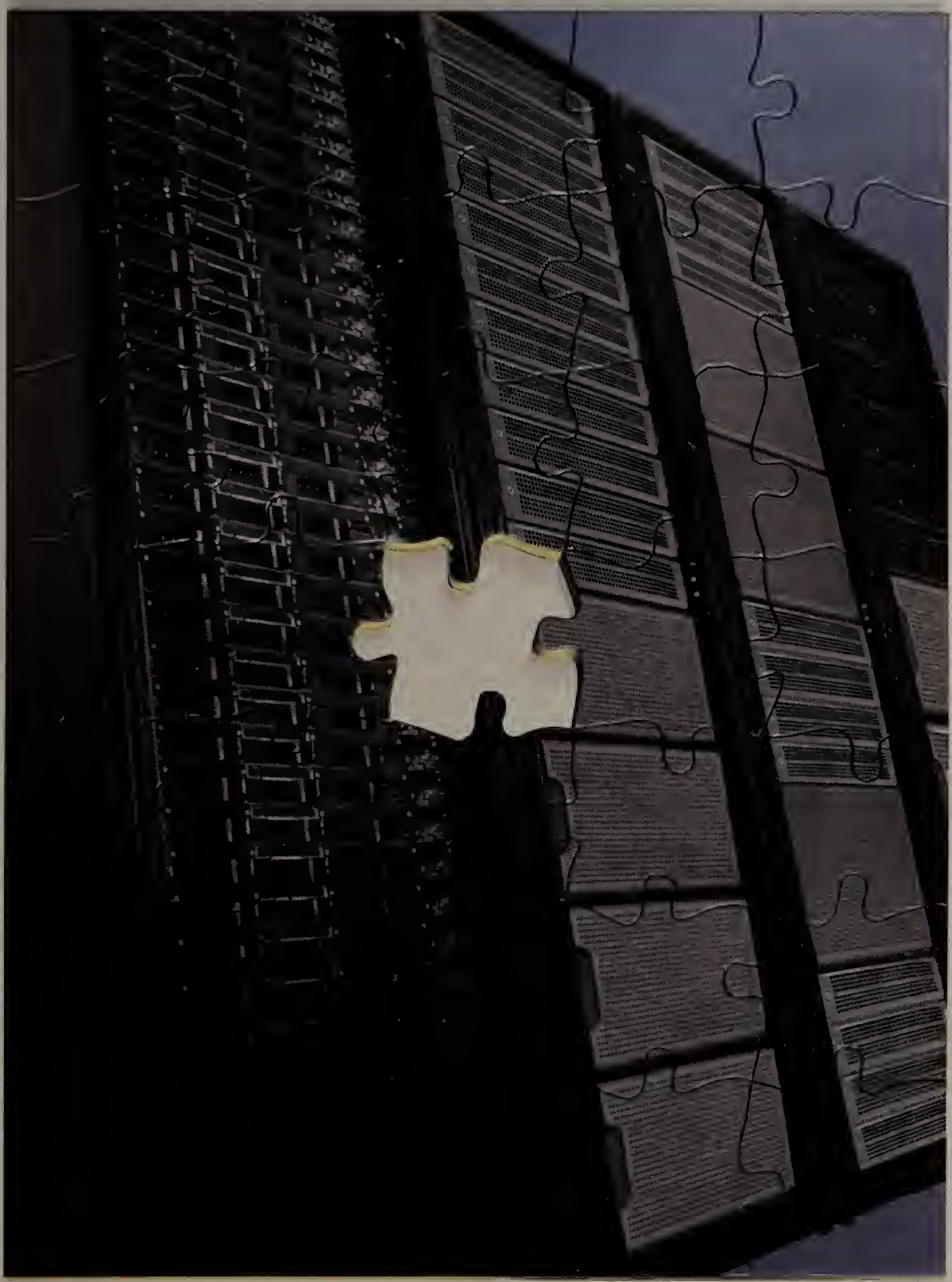
Edden says being an IT vendor within a financial institution has unique challenges, such as convincing some line managers why the bank should sell its software to rivals. "If [the rivals] are going to buy a product like ours anyway, why not spend their money with us?" he says. "A more sensitive issue is how to deal with other vendors that may be selling to Silas or Wachovia. When I was a customer, I could ask vendors anything, but now I can't."

Some former IT co-workers resented it when Edden and others were given jobs at the spin-off. However, Edden says prospective candidates from Wachovia were told they'd be expected to work as though they were employed at a start-up, with all the associated risks and opportunities.

"Some people joked that the bank took all the weird people and put them in a group so that it could keep an eye on us," he says. "That may have some element of truth. The people who populate spinoffs have skill sets that may not excel in large corporations, but are effective in small businesses."

Above all, Edden says he relished the challenge of jumping from an executive IT position to selling. "In some ways it has been invigorating because many IT people love creating and problem-solving, and this provides an arena for a greater focus than in my previous roles," he says. ■

It always happens with the last piece...



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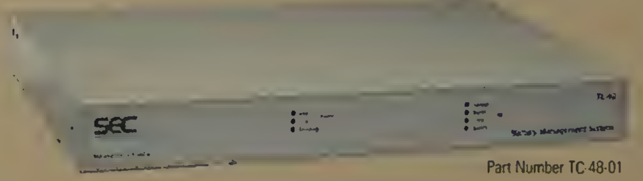

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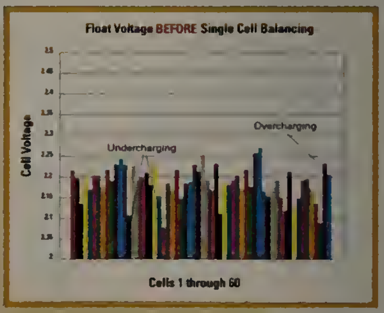

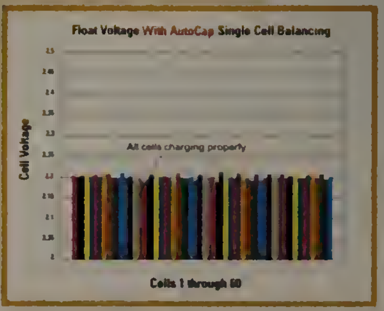

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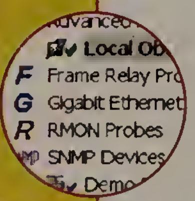

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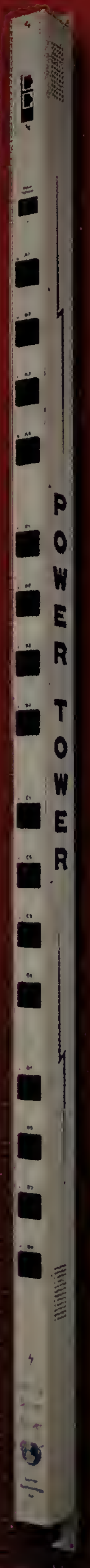

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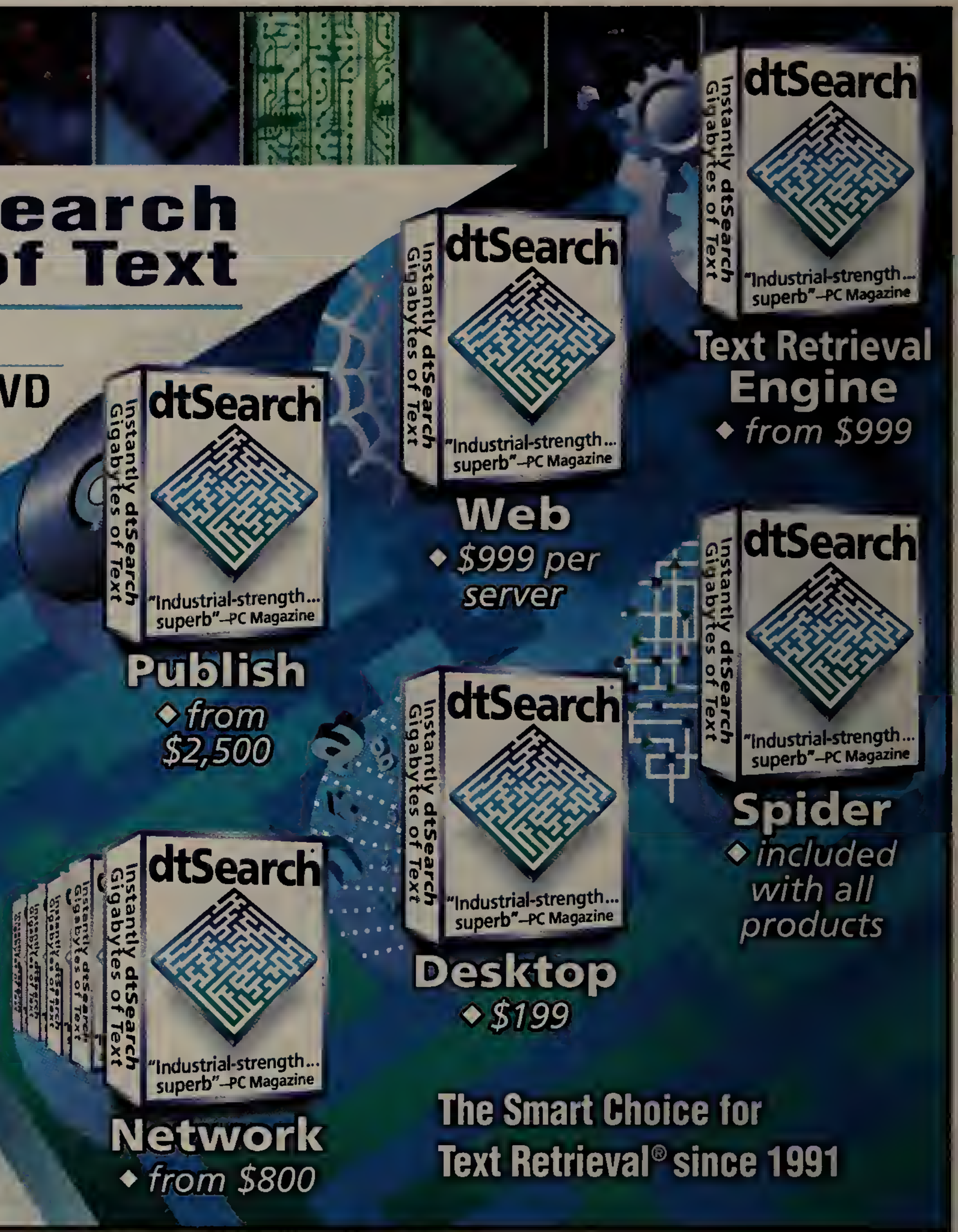

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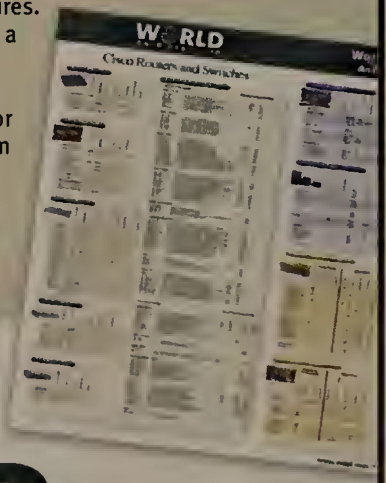

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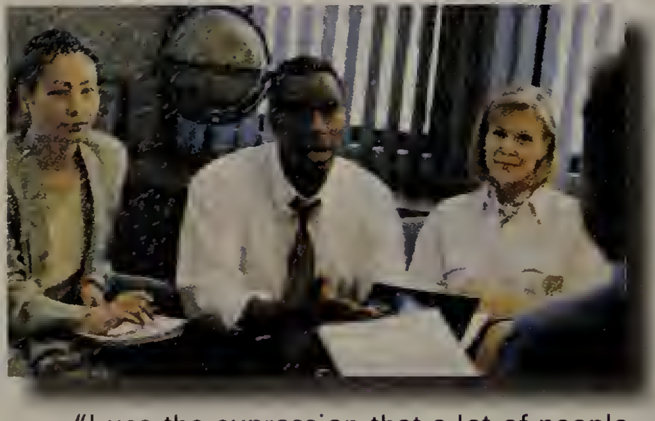
When Robert Knowling, chairman of SimDesk Technologies, reviews information about diversity and the IT industry, he has two reactions. The first is a sense of overwhelming as he scans the reams of data and studies compiled over the past 10 to 15 years. The second is a sense of urgency.



"I use the expression that a lot of people have been enjoying the issue of diversity for a long time," he says.

"I've seen a lot of assessment and generic, rather benign recommendations. What I have not seen are profound ideas that can be embraced by the business community and help us eradicate the problem."

Knowling and a group of his peers plan to develop those profound recommendations as members of a Blue Ribbon Panel on Diversity convened by the Information Technology Association of America. Knowling and his fellow panelists have reviewed data and studies. Panel members began work last fall, meeting in December to begin articulating an action plan. One fact that stood out: 11 percent of those enrolled in IT-related university studies are African-Americans. However, only 3 percent of them land jobs in the industry. Knowling is asking for parallel data on other minorities and women, but believes it will be comparable.

A final plan will be ready in time for ITAA's Workforce Convocation in May. Already, the plan hints of something different – including a look at the issue of workforce development and diversity in the same manner that a business would a product or business life cycle, from grade school introduction through diverse representation on high tech companies' boards of directors.

"Diversity in the high tech and IT industries has long been a problem," says Knowling. "The challenge has been made more difficult with the downsizing of the high tech sector. At the end of the day, we plan to present an action plan that will increase the number of diverse candidates going forward. If in two years we haven't changed the profile, then we haven't succeeded."

Others represented on the Blue Ribbon Panel on Diversity are ITAA, Catalyst, Computing Research Association, The Benton Foundation, ITT Educational Services Inc., PricewaterhouseCoopers LLP, OpNet Community Ventures Inc., Plugged In, AOL/Time Warner, Education Development Center Inc., U.S. Department of Labor, Columbia University, WorldCom, the National Urban League, Unisys Corporation, Women Work!, University of Iowa, Oracle Corporation, Howard University Television, Northrop Grumman Information Technology, Dice Inc., Career Communications Group Inc., and SRA International.

For more information on the panel's work and the May Convocation, go to www.itaa.org and select Workforce Development.

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Senior Application Technical Specialist. Design and implement video and audio processing modules, digital signal processing algorithms and portable software for Sun/Solaris and Intel/Linux. Utilize XML, CORBA, Sybase, C++ and Java to implement data processing software. Perform object-oriented design and documentation using UML and Rational Rose. Utilize C++ and Java to implement image processing algorithms and image format conversion software. Implement solutions using JPEG, MPEG and AVI formats. Create release software using Solaris and Linux package management utilities. Lead design and code reviews. Responsible for system design and coding in UNIX. Provide production support. Must have Bachelor's degree in Computer Science, Engineering or equivalent, 2 yrs exp., and knowledge of Sun/Solaris, Intel/Linux, CORBA and XML, JPEG, MPEG and AVI formats, and analog and digital TV signals. Must have knowledge of UNIX interfaces including memory map, shared memory, Posix threads and driver APIs. Must have knowledge of C++, Perl, and Unix shell scripting. Send resume with cover letter to Nielsen Media Research, Attn: P. Lyons, 375 Patricia Ave., Dunedin, FL 34698.

Sr. Systems Engineer/Project Manager, Keene NH: Lead a team responsible for software eng'g, systems development & arch., maintenance & customization for legacy insurance system, using COBOL, Assembler, CICS, mainframe & client server technologies. Manage client projects on-site. Perform project development, resource management, application design & development, QA & debugging. Req'ts: BS in CompSci or IT + 5 yrs exp. in job offered or in systems development & software eng'g for mainframe legacy systems in insurance or banking industry, using COBOL, Assembler & CICS, with at least 3 years as team lead or project manager, & knowledge of JCL & Metamon suite of tools. Will accept 2 years additional relevant exp. in place of any missing yr towards required 4 yr BS. 40 hrs/wk; $70/hr, no benefits. Send two (2) resumes/letter of application to Job Order #2003-077, PO Box 989, Concord NH 03302-0989.

Positions are available for a Vice President, Products and Professional Services and a Consulting Manager in Atlanta with an e-business technology company. The company provides solutions that enable corporations and software providers to leverage emerging technologies to more effectively compete in the global market.

The Vice President has worldwide responsibility for professional services and product management of the Company's entire suite of products. Specific responsibilities include profit, loss, planning, and budgeting for professional services organizations with a quarterly quota of several million dollars.

The Consulting Manager is responsible for technical architecture and design, management and implementation of multiple global client projects, relationships, and initiatives, including developing strategic relationships at Fortune 2000 companies.

Candidates for the Vice President's position should possess a Master's degree in a Computer field and at least five years' experience managing development staff and/or consultants, including two years' experience in project management and development of AS/400 (COBOL, RPG) systems and mainframe (COBOL, PL/I, IMS, or DB2) systems; implementing large-scale web-based systems (HTML, or Java); and development of programmatic interface to legacy systems.

Candidates for the Consulting Manager's position should possess a Bachelor's degree in Computer Science or a related field and at least three years' experience in IT solution design in-cluding design of infrastructure, data communication, software and databases; two years' experience in technical training, third generation programming including C, C++, and Assembler languages; and two years' experience in project planning and management of technical solutions for middleware projects.

Apply by mail with resume to:
Lisa Wannamaker
Jacada Inc.
400 Perimeter Center Terrace
Suite 195
Atlanta, Georgia 30346

Technical Recruiter and Resource Specialist who will review, screen, recruit and place specialized technical IT consultants. Will interview applicants to match skill, knowledge and experience with client requirements. Will conduct reference and background checks. Will negotiate client and candidate contracts and ensure compliance with company and legal standards. Will create and maintain databases of client and applicant information. Will generate database reports for strategic planning and client development. Applicant must have at least four years work experience as a Technical Recruiter and Resource Specialist. Applicant must have a Bachelors degree in Business Administration or Human Resources. Applicant must have knowledge of IT systems, networks and languages, including Siebel, CRM, Actuate, E-Business, PeopleSoft, SAP and data warehousing. Applicant must have working knowledge of US immigration laws. Work involves extensive travel. $44,500/year, 40 hours/week, 9:00am-5:00pm. Send resume, listing Job Order Number WEB 295700 to Site Administrator, Greene County Team PA CareerLink, 4 West High Street, Waynesburg, PA 15370-1324.

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NetWorks Communications dba Eon Business has an opening in our Centennial, CO office for a E-Commerce Developer to design and develop e-Commerce software applications. Successful candidates will have a bachelor's in computer science or related field (including computer engineering) and at least three years experience in the design and development of software applications using VB, ASP, COM and .Net technologies. Candidates must also have working knowledge of data warehousing, data mining and on-line analytical processing in a SQL Server 2000 environment. Interested candidates should send resumes to Nico Brooks, Eon Business, 7430 East Caley Ave., #200, Centennial, CO 80111.

Software Engineer: R/D & develop computer telephony software systems using knowledge of C, C++, UNIX, MGCP, SIP, H323, MEGACO. Mail resume to Mass Soft Services, Inc., 500 Clark Road, Tewksbury MA 01876

Sr DBA lead teams to perform Oracle database admin. on Sun Solaris, UNIX, Linux, Windows NT; design/develop client server appls using Oracle, PL/SQL, Dev 2000, Crystal Reports; perform data migration; design/review logical/physical data model using ERWin; setup & maintain OLAP databases on Oracle & SOL Server using replication tech, propose/implement methodologies/ best practices. Require M.S or foreign equiv in CS or Buss Admin with 2 yrs exp in IT. High salary. F/T. Travel reqd. Resumes to HR, ChannelWave Software, Inc., One Kendall Square, Suite 200 Cambridge, MA 02139

Sr. Network Administrator - Responsibilities incl but not limited to Install & administer Windows & Unix based TCP LAN & WAN. Use VPN solutions across Internet. Implmt security components. Optimize traffic using Cisco Works, MS Baseline Security Analyzer, Kiwi Syslog, & Network Analyzer. Use Observer sniffers & MRTG to monitor network. Configure Cisco PIX firewall & routers. Edu & exp req'd. Send resume to Utility Automation Integrators Inc. Human Resource Dept., 307 Wynn Drive NW, Huntsville, AL 35805. EOE

Database Computer Consultant needed by a Computer Service & Integrator company in Lincolnwood, IL. Must have at least a Bachelor's Degree in Computer Science with 6 months experience in the job offered or positions in database consulting/development/management. Reply to President, Compuelectronics, 6512 North Lincoln Ave., Lincolnwood, IL 60645.

Oracle Applications Practice Manager required. Applicants must have at least 3 years experience managing all aspects of a national Oracle practice. A bachelor's degree in Business Administration or similar is required. Ovation Group offers competitive compensation and benefits to all its employees. Please send resume to J. Rodriguez, Ovation Group LLC. 8200 NW 41 Street, Suite 325, Miami, Florida 33166 Fax: (786) 866-2731

Seeking qualified applicants for the following positions in Memphis/Collierville, TN: Senior Programmer Analyst. Formulate/define functional requirements and documentation based on accepted user criteria. Requirements: Bachelor's degree* in computer science, MIS, engineering or related field plus 5 years of experience in systems/applications development in a mainframe environment. Experience with Cobol, IMS DB/DC and Xpeditor also required. *Master's degree in appropriate field will offset 2 years of general experience. Submit resumes to Sibi George, FedEx Corporate Services, 1900 Summit Tower Blvd., Suite 1400, Orlando, FL 32810. EOE M/F/D/V.

Customer Service Representative with computer support experience. Send resume to Adamant Computers, Att: Victor, 4572 Renaissance Pkwy., Warrensville Hts., OH 44128. Please reference job code CSR.

SYSTEMS ANALYST (2 positions) - Analyze, design, code, test, and deploy computer software programs & databases. Req'd: BS in Electrical Eng., CS, or Math; 2 yrs. exp. in job/software development job; exp. w/ Oracle, XML, & PL/SQL; extensive exp. w/ database design and development. Send resumes to Forest Laboratories; 500 Commack Rd., Commack, NY 11725. Reference #12.

Manager, Software Development sought by NJ based Securities Dealer for position in Chicago, IL office. Must possess Bachelor's degree or equivalent in Computer Science or directly related field and 5 years exp. in software/systems development and design including C/C++, JAVA, PL/SQL. Respond to: Human Resources Department: KFP02-095: Knight Financial Products, 130 Cheshire Lane, Suite 102, Minnetonka, MN 55035.

Programmer/Analyst sought by NC based manufacturer and delivery company. Must possess Bachelor's degree or equivalent in engineering or directly related field and 2 years exp. in Software/systems development/design/analysis including C++, Java. Respond to: Human Resources Department, MacLeod Construction Inc., 4333 Racing Drive, Denver, North Carolina 28037.

Systems Administrators needed at client sites for e-commerce telecom systms & s/ware dvlpmt using CONNECT:Direct, BEA Message Queue, SRM, Tivoli DM, & Axent, etc. Send resume to: Global Consultants, 601 Jefferson Rd, Parsippany, NJ 07054

Industrial Engineering (College Station, TX): Designs computer simulation models to solve industrial engineering problems using ARENA and Witness. 1 yr. related exp. Contact: Mr. Benjamin of Knowledge Based Systems, Inc. at 1408 University Drive East, College Station, TX 77840; 409-260-5274(T); 409-260-1965(F).

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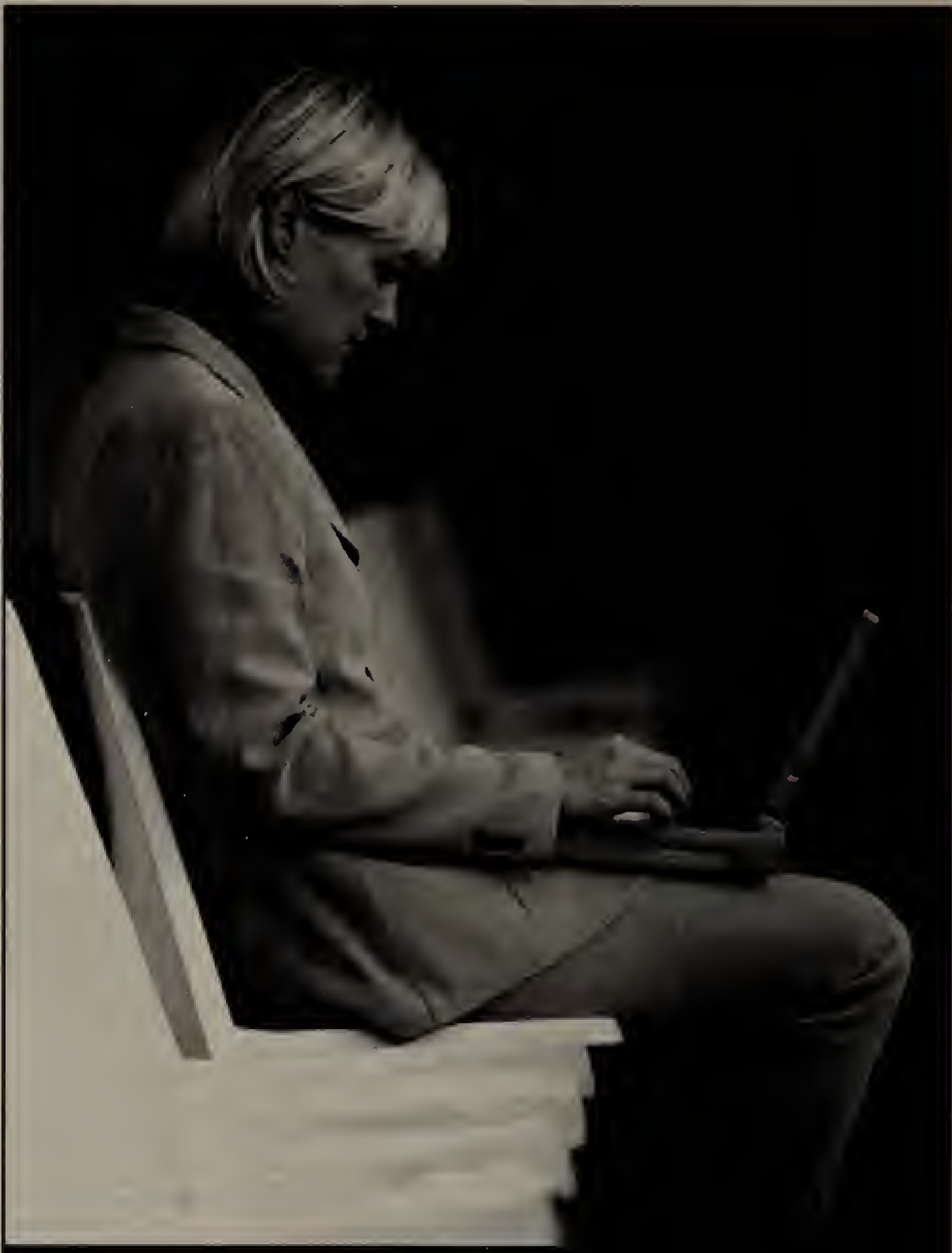

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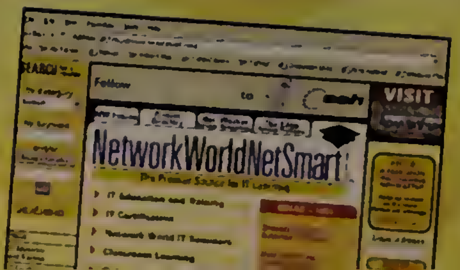

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Sr. Programming Analyst (multiple positions). Design customized techn appl programs. Install & config program prod. Determine tech infrastructure & comm. Req. Test appl. Analyze, design & develop app. Interfaces using IBM AS400, RPGLE, C/400 & Java/400. Req. BS in Comp. Sci., Comp Eng. Or Elect. Eng. And 5 yrs exp as Programmer. 40 hr/wk. Job/interview site: Irvine, CA. Send resume to SVI Solutions, 5607 Palmer Way, Carlsbad, CA 92008.

Next Generation Professionals seeks applicants for position as Software Engineer in Denver CO to engage in Oracle database programming. Requirements for position must have a bachelor's in Computer Science, Engineering Science or related field (including Botany) and at least 3 yrs exp in Oracle database programming. Requirements also include a working knowledge of Unix (Shell Programming), Developer 2000, ERWin, C, SQL (Tuning and Optimizing), PL/SQL and Oracle Enterprise Manager. Respond by resume to Next Generation Professionals, 10 Valente, Irvine, CA 92619.

SENIOR APPLICATION DEVELOPER to design, develop, analyze, implement and maintain web-based software applications using VB.net, JavaScript, ASP, ASP.net, COM/DCOM, HTML, C++, SQL and MS SQL Server; integrate Microsoft web-enabled products with front-end systems and back-end systems. Require: M.S. in Computer Science/Information Systems. Competitive salary and benefits. Apply with resume to: Vice President, McKing Consulting Corp., 2900 Chamblee Tucker Road, Building 11, Atlanta, GA 30341 (Job# GL001).

Systems Analyst – Analyze client's system requirements & specification analysis, software development, implement & integration testing, conduct system installation & maintenance, work w/ MS SOL 7.0, ASP, Cold fusion, Crystal report. Bachelors in Computer Science or Mathematics & 2 yrs exp. in job offered. 40 hrs per wk, 9AM-5PM. Fax Resume to Accelerated Ecom, Inc. Attn: Martha Lange (954) 370-9127.

Boehringer Ingelheim Pharmaceuticals, Inc. has an immediate opening in its Ridgefield, Connecticut facility for the position of Principle Systems Engineer.

Provide leadership and expertise in support of all application development efforts for purchasing; analyze, design, develop, maintain and support Ariba Purchasing system and Ariba Buyer eProcurement application and make technical and functional configuration changes and customizations.

Must possess a Master's degree or its equivalent in Computer Science, Computer Engineering or a related field and relevant experience with e-procurement applications, Ariba Buyer (ORMS, 7.0.4/7.0.6), TIBCO, AML, AQL and XML and customizing/creating Ariba-SAP, Ariba-CSV and Ariba-Oracle interfaces for successful implementation of Custom E-forms.

Resume and/or cover letter must reflect each requirement above and specify reference code AD-GCD/GC1602 or it will be rejected.

Forward resume to: BI Staffing Center, PO Box 534, Waltham, MA 02454. Fax number: (781) 663-2431. Email: BIPI@Bi-careers.com

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Director of IT (Network Sys. Mgr.). Atlanta, GA. Lead IT teams in U.S. & Romania for datacenter admin. & mgmt. Respon. for network & system mgmt./design/implem./coord. of data betw. U.S. & Romania. Respon. for datacenter infrastructure mgmt., incl. dvlpg. & implem. maintenance procedures & security policies & deploying web & DB svcs. Respon. for maintaining communications betw. U.S. & Romanian offices & maintaining secure connection for transmittal of proprietary info. betw. offices in the 2 countries. Liaison w/ Romanian offices for datacenter issues. Maintain customer relationships. Req.: Bach. degree (or for. equiv.) in CS, Telecomm. or Electronics. 5 yrs. exp. as Network Engr. or Network Sys. Engr.; exp. as follows (may be concurrent): 5 yrs. exp. in network & sys. design/implem./admin.; working knowl. of Windows NT/2000/XP, Linux workstation & server OS, Cisco Routers config. & maintenance, PBX admin. & maintenance, Apache Web Server, Microsoft IIS, DNS BIND, MS Active Directory, SQL 7.0/2000 & Informix; and MCP and CCNA certifications. Proficiency in Romanian. Resume to: Ms. Denise Glenn, NIVIS LLC, 1000 Circle 75 Pkwy., Ste. 300, Atlanta, GA 30339.

NETWORK SYSTEMS ADMINISTRATOR

Quincy Public Schools is seeking a Network Systems Administrator to maintain network services, hardware systems and software applications for a 500+ computer network system in an educational environment. Must have a BS in computer science or a related field and at least one year of experience using: Network Configuration, Visual Basic, Visual C, Database Maintenance and Administration, Unix and Windows 2000/NT. Interested applicants should send resume to: qps172hr@qps.org EOE

TechNation Software Consulting, Inc, a software consulting company with its main place of business at Sioux Falls, SD has multiple positions for Software Professionals.

Sr. Software Engineers: BS In CS, or equivalent with more than 5 years of recent programming experience or MS in CS with more than 3 years of such experience. Duties entail programming, gathering user requirements and customization of software in either of a) Database Systems which involves database design, data modeling working in both front end as well as backend applications on Unix and Windows platforms. Or in b) systems side programming in Unix, C, C++ which involves product development, working on telecom protcols or development of device drivers.
Both positions require knowledge of allied Internet technologies like Java, JSP, XML, J2EE and ASP.
Unix Systems administrators: BS in Computer Sciences or equivalent with atleast five years of experience in an enterprise environment. (i.e. more than 500 users) Duties include extensive use of Network Implementation and Administration, System Integration, Backup and recoveries, shell scripting and System Securities. Experience in Management of Enterprise Network Storage devices (SAN or NAS), HP and Solaris Servers, switches, HUBs and in Veritas NetBackup systems.

TechNation provides onsite consulting services to clients across the United States and hence a **key requirement** for all positions is that candidates must be willing to relocate across the country for periods between 3-6 months or as needed.

Send resumes to Madhukar Gangadi, 300 N. Dakota Ave. Suite #208, Sioux Falls, SD 57104 or email to madhukar@tnscinc.com. Fax: 605-338-7507

Simulation Analyst. Develop workforce staffing models for Request For Proposal support in new business development. Design and develop call center simulation models using ARENA, SIMAN, and CallSIM software to replicate client network. Database analysis of call center metrics to improve decision-making process. Must have Bachelor's degree in Engineering, Mathematics, Statistics or equivalent, one year experience, and knowledge of ARENA v 5.0 or higher; CallSIM and SIMAN in Windows environment; C++ programming; VB 5.0 or higher; and TCS/IEX/Blue Pumpkin. Send resume with cover letter to Cindy Corkery, APAC Customer Services Inc., 6 Parkway North Center, Deerfield, IL 60015. EEO/AA
APAC CUSTOMER SERVICES, INC is not affiliated with APAC, Inc., the road paving and construction materials company.

Saninfo is a Chicago based IT company looking for computer professionals and engineers Candidates must have degree with some IT experience, must have US work permit. We offer competitive wage with full benefits. Please apply at san@saninfo.com. EOE

Minisoftech has openings for system/programmer analysts or software/project engineers. We are small but relatively stable. Applicants must have BS plus experience in IT field. Skills in Java, JDBC, HTML preferred. Please send resumes to hrd@minisoftech.com. EOE

Programmers, Jr. Programmers, Software Engineers & DBAs: Design, develop, test and implement specialized software apps. in (a) Oracle Financials and Manufacturing 11i and related tools, Erwin, Cognos Suite, Business Objects, and MF Cobol (b) SQL DBA, Unix Admin., VB, Sybase, Cobol, C, Cold Fusion and related technologies; (c) J2EE and related technologies, Rational ClearCase, CORBA, MQSeries and related tools; (d) BDF, JPROBE, Test Factory, Requisite Pro, CORBA, Patrol, DB, LDAP Server, and Silk Pilot; (e) EAZYTRIEVE+, Xpedio Server, SQL Backtrack, PatrolDB, NetIQ, Infopac, Netview and Gauntlet Firewall; (f) PeopleSoft HRMS (HR, Payroll and Benefits Administration) Application Engine, SQR, Cobol, DB2, CICS, nVision, Crystal Reports and related tools; (g) Java and related tools, CORBA, Sybase, Swing and Rational Tools (h) Oracle Database Admin. in Oracle 11i, Oracle Enterprise Manager, Solaris AIX, VB, C++, SQL*Plus and related tools; (i) Cold Fusion and related tools, ASP, XML, DHTML, Crystal Reports, Java, VB, DCOM, MS SQL and Oracle 8i; (j) Oracle Financials and PeopleSoft, Tuxedo, Developer/Designer 2000 and related tools; (k) Hyperion Essbase Apps. and related tools; (l) Oracle, Peoplesoft, ASP, Java and related tools, SQA Robot, Mercury Test Director and Silk; (m) Clarify and related technologies; (n) JDK, ASP, CORBA, Oracle, SQL Server, Linux, VB and HTML (o) SAS and related packages, Java, Business objects and Oracle. US Workers only. Consulting positions requiring travel. Prevailing wage/benefits. Send resume to HR, SSG, 2005 Concord Pike, Suite 209, Wilmington, DE 19803, identifying interested position(s). No Phone calls please.

V.P. Of Marketing for fiber optics telecommunications component manufacturer located in Woburn, Massachusetts. Requires MBA and minimum 2 years experience directing the marketing activities of an optical telecom company, including researching and identifying new technical requirements and specifications for products, communicating strategic and tactical product requirements to engineering, working with engineering to develop new product specifications, researching potential target markets for products, developing pricing strategies to maximize market share, and directing and administering company marketing program. The position is located in Woburn, Massachusetts with 50% domestic/international travel. Send resume to Marshall Parker, Polychromix, 10 State Street, Woburn, Massachusetts 01801.

Associate Director of Records and Technology. Develop & maintain existing complex data sys. such as degree & audit student records sys; oversee integral implementation of Advisement Reports; design and implement queries to meet internal and external reporting needs; provide training for staff trainers. Must have BS in info sys. or equiv. & 5 yrs exp. in sys analysis and application development. Respond to: Luz Agosto, HR Dept. DePaul University, 1 E. Jackson, Chicago, IL 60604.

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Linux

continued from page 1

server IBM offers.

IBM will also announce a 40-node Linux server cluster that will run a DB2 database. The idea is to lower the cost and improve the uptime of large databases running on Linux IBM says.

In addition, IBM will introduce its Tivoli System Automation software for monitoring and managing individual Linux servers and clusters, as well as Linux client support for its browser-based Lotus iNotes groupware software.

Dell plans to announce a new configuration for its High Performance Computing Cluster (HPCC) Program with an offering of up to 132 PowerEdge 1655MC blade servers running Red Hat Linux in a single rack. The company also will showcase a 128-node cluster of PowerEdge 2650 servers running Red Hat and using high-speed interconnect technology from Myricom for supercomputing applications.

Other new Linux products expected at the show:

- Ximian will release Version 1.2 of Red Carpet Enterprise, an automatic Linux server patch and security updating system. The new version offers faster connectivity to the service through proxy firewalls and an improved roll-back function for undoing patches or software added to Linux systems through Red Carpet Enterprise.
- MetaLinx will have a version of its iSystem Enterprise system management software that the company says can "virtualize" management of Linux servers by controlling multiple Linux boxes as a single system. This could allow a smaller staff to control a large network of Linux nodes.
- To manage Linux instances running on a mainframe, Candle will introduce its Omegamon XE product for setting up, configuring and partitioning Linux servers on IBM's zServer and S/390 platforms.

Big businesses that have dabbled with Linux at the edge of the corporate network are looking to expand usage of the open source operating system. Some net executives say they'll be at LinuxWorld to see whether Linux is ready for data-center prime time.

Lefkowitz says Merrill Lynch will continue to search for ways to expand the use of Linux in its data center — two areas he is considering are migration of a Unix-based database server to Linux, and middleware applications.

Thompson Financial got its toe in the water with Linux a few years ago when it decided to set up 10 Linux boxes as firewalls for one of its online trading data centers in the Midwest. Now the company is considering going further with the technology.

"Linux is not yet in our data center, but it has a serious role," says Doug Moorhouse, a Unix administrator for Thompson Financial, in Milwaukee. Linux firewalls protect IBM RS6000 servers running AIX and DB2, which execute back-end electronic trades for eTrade. He says the Linux boxes replaced more costly firewall servers such as RS6000 and Sun boxes, and appliances from Cisco.

"All companies that are feeling the hurt from the recession have to find cheaper and better ways to operate," Moorhouse says. Using Linux as a firewall and VPN "is something that helps us do that."

AT&T uses mostly Unix servers to process its accounts and do analytical forecasting, but Linux is banging on the data-center door, according to Brian Cashman, systems administrator at AT&T.

"We have Linux running currently on a small scale, mostly in small departmental uses and some of our administration staff use it personally, but we're looking to integrate it further into our larger systems," Cashman says,

"Linux seems more affordable to us," than the Sun and SGI Unix systems that AT&T currently has, he says. "The fact that you're running it on a much cheaper and easier-to-maintain platform is attractive. The Intel platform doesn't tie us into a costly service and maintenance contract."

Over the past several years Linux has made steady gains on the edge of corporate networks. But the use of the technology has been limited largely to roles such as Web, e-mail file and print serving. Advances in the Linux kernel, such as increased symmetric multiprocessing support, have made it comparable to Unix and Windows platforms for running applications in large data centers, industry observers say.

A recent Goldman Sachs report on Linux in corporate data centers, titled "Fear the Penguin," says that "although the majority of corporations still appear to view Linux as a nascent technology that is not yet enterprise-ready ... our survey suggests that Linux-on-Intel is beginning to gain a foothold in the data center."

The report also says Linux will be a bigger threat to Unix than Windows, as companies look to replace proprietary Unix/RISC architectures with Linux and Intel boxes, which generally are less expensive. It says Linux will not take over corporate data centers from Unix and Windows servers, but could pose a serious challenge, especially to Microsoft's recent data-center push.

"[Linux] will hamper the movement of Windows into the enterprise data center, an area Microsoft has only recently begun to target for growth," the report says.

In another recent report, Giga Information Group analyst Stacey Quandt writes that there is interest in Linux as a corporate data-center server, particularly as a database-management systems (DBMS) platform.

"Linux has crossed the technology adoption chasm in the context of Web server [Apache], application server, and file and print services deployment," Quandt wrote in the report, adding that major DBMS vendors, such as IBM, Oracle, Sybase and Teradata, have had stable Linux products for several years.

"IT professionals and their business clients should carefully consider the variety of DBMS solutions on Linux and map this to the certification and support of a Linux distribution provider," she writes.

Thompson Financial's Moorhouse says he has not considered Linux to be on the same level as AIX for database serving, but he's open to the idea of running Linux in that role.

"We still have our IBM AIX contracts to honor, but we're always thinking down the road." ■

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Microsoft sizes up the penguin

A sign that the IT industry has taken notice of Linux is that for the second year in a row the world's biggest software firm (and Linux antagonist) will have a booth at LinuxWorld,.

While Microsoft's past attitude about Linux could be described as aloof or indifferent, the company has been more watchful of Linux as an enterprise competitor.

Microsoft's Peter Houston sees the data center market in the near future as a "two-horse race" between Windows and Linux.

"Things have changed," over the last few years, says Peter Houston, senior director of server strategy at Microsoft. "One of the biggest changes has been IBM's emergence in the Linux space. We have to take these things more seriously than we would have before."

Houston says the uptake in Linux has come more at the expense of Unix vendors' installed bases than Microsoft's, as customers look to move from proprietary server architectures to lower-cost Intel boxes. Over the next few years the corporate data-center market will come down to Windows and Linux, Houston says.

"We'll be seeing sort of a two-horse race," he says. "We'll see Microsoft with its value proposition going up against companies like IBM and their value propositions with Linux. If you think of the Unix value proposition over the last couple of years, it's almost not interesting to people anymore." Now that the major data-center Unix players — HP, IBM and Sun — have Linux offerings means Unix might become a growth platform in big corporations, Houston says.

Houston expects Windows to succeed in data centers, claiming that it is less expensive to support, install and maintain than Unix, and even Linux servers. He also says that Microsoft's model for developing enterprise software is more sustainable over the long run than the open source model on which Linux is based — which is unpredictable and inconsistent about its focus. But there are some things Microsoft has learned from Linux along the way, he adds.

"[T]he community model is pretty good," Houston says. This has led to more community efforts at Microsoft, where customers have had more access to Microsoft developers than before.

"On the technology side, one of the things that we'd liked to see is more componentization in our server architecture," similar to Linux, he says. "When you look at Linux, it's fairly straightforward to deploy . . . . If you want to run a Web server, you just strip it down and take out what you don't need. In the next releases of Windows Server 2003, we've done a lot of things to make it deployable with a smaller footprint, minimizing the number of services that don't need to be there."

— Phil Hochmuth

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BackSpin Mark Gibbs

Planning for '03

The beginning of a new year is a good time to be thinking about our plans. We need to look at our strategies and our tactics, figure out how we got to where we are and figure out where we are going.

Traditionally we thought of strategic planning as a window of three to five years and the tactical window as one to three years. But the PC revolution and then the Internet revolution made those time frames look like geological epochs.

Now the strategic window is seen as one to two years (although arguably sometimes it's not seen at all), while the tactical window is so short that for some of us what we're going to have for lunch is part of our considerations. ("Let's see, it is now 1:30 — I'll just have a Coke 'cause I've got to get that enterprise CRM system installed and running by 2 p.m.")

It would be a joke if it wasn't so dang serious. And now that we're post-iBubble, many of us have tried to take our foot off the gas, at least a little bit, and go back to a less frenetic pace of life — albeit one that is faster than pre-iBubble and much, much faster than pre-PC.

The problem with slowing down is that we don't feel that we can. This is because one of the most interesting aspects of "Internet time" — the compulsion to grab onto technologies and products that gave companies, at least in theory, opportunity advantage.

Typically these were technologies and products that were supposed to enable us to do things faster. So, we used them and gained (we thought) a competitive advantage.

Then what happened? Our competition adopted the same technologies and products and soon there was no advantage — the playing field was leveled. But in the process we all pushed a little harder on the gas pedal.

We'd been heading down the road at 50 mph, and each month we'd gone a little faster. Suddenly we were all doing 100 mph!

The trouble is that the business freeway is so crowded that common wisdom says if you take your foot off the gas even a little, the guy behind you will run over you and laugh as he does so!

At least, that's what common wisdom says will happen.

The question we should all ask ourselves is whether this headlong rush is a real necessity or something we've convinced ourselves is the way business must be run.

I contend that the manic drive to keep up with the traffic has led us to become sloppy and build business vehicles that cost us as much as we profit from them.

What has happened (and still happens) is that the decisions that we have made (and still make) about immediate business acceleration will come back to bite us in the long term.

Look at all the Web sites and online customer service operations that are pathetic in terms of delivering any kind of value to their intended audience. The owners of the businesses behind these ventures rushed online because everyone else was doing so — they thought they were keeping up with the traffic. Then in the ongoing pressure of business they lost sight of, well, their sites.

Now these companies have created a real problem for themselves — do they make their online activities actually work, or do they abandon them? What about the investment and brand issues that are involved with either decision? They are going to have to deal with the fact that they never considered the strategic consequences or their tactical decisions.

So at the start of a brand-new year, you might want to look at where your past decision making might catch up with you, and revisit what you think is tactical and what you think is strategic.

Share your plans with backspin@gibbs.com.

'NetBuzz News, insights, opinions and oddities

By Paul McNamara

This just in: The 'Net's not important

Life's too short to be running around correcting all the nonsense about the Internet being peddled by the mainstream press, yet a few examples are so flagrant as to beg for a reply. Take this bit of pabulum penned last week by long-time *Washington Post* and *Newsweek* columnist Robert Samuelson:

"The obvious truth about the Internet [though one rarely acknowledged] is that it's not especially important. Of course it has grown spectacularly. We e-mail. We buy from eBay. We get homework from the 'Net. We have access to vast stores of information. But if the Internet collapsed tomorrow, most Americans would go on with their lives in a way that would not be true if, say, they could no longer drive their cars. (The same might not be true of businesses.)"

It must be his kids' homework that Samuelson has gotten from the 'Net, because heaven knows he hasn't done any of his own.

Sure, the Internet has been crazily and lazily overhyped by virtually everyone with a stake in it, including those who do what I do for a living. But not especially important? Compared with what?

Samuelson chooses the automobile — only the most important invention since fire — as his comparison point. I guess he's right on that score. The automobile is today and likely always will be more important than the Internet. How insightful.

But after the horse-and-buggy killer, what else might be reasonably judged more irreplaceable than the Internet?

Television? Absolutely, no matter what any of us might think of "Joe Millionaire" or the fact that the idiot box made a rich man of Tony Danza.

The airplane? Yes, from a strictly economic standpoint, although I might argue the [illegible] in terms of overall societal impact, because — to borrow Samuelson's criterion — "most Americans" rarely fly.

What else might top the 'Net in importance? We might get into materials such as steel or plastic, but that's cheating in this context.

Radio? Before television, probably. After television, I'd lean against. (You can get almost anything that's on radio today over the Internet instead. Who'd miss AM and FM besides Howard Stern fans?)

Anything else? Let's suppose we can come up with another handful on which we all agree. That would still leave the Internet as — what? — one of the 10 most important inventions since the dawn of the 20th century?

But I don't want to dwell on just that "not especially important" nonsense when there's so much other nonsense to dwell on.

"Of course it has grown spectacularly," the writer acknowledges.

Why, yes, it has. I'm sure you've all seen the comparison timelines for things like TV, the telephone and the car. Over the first 20 years of its existence — less than 10 of which have seen it even available on a mass scale — use of the Internet has grown faster than has anything else you can name.

"We e-mail," he notes.

Just like that: "We e-mail." Much as if Watson had said to Bell: "Oh, we talk."

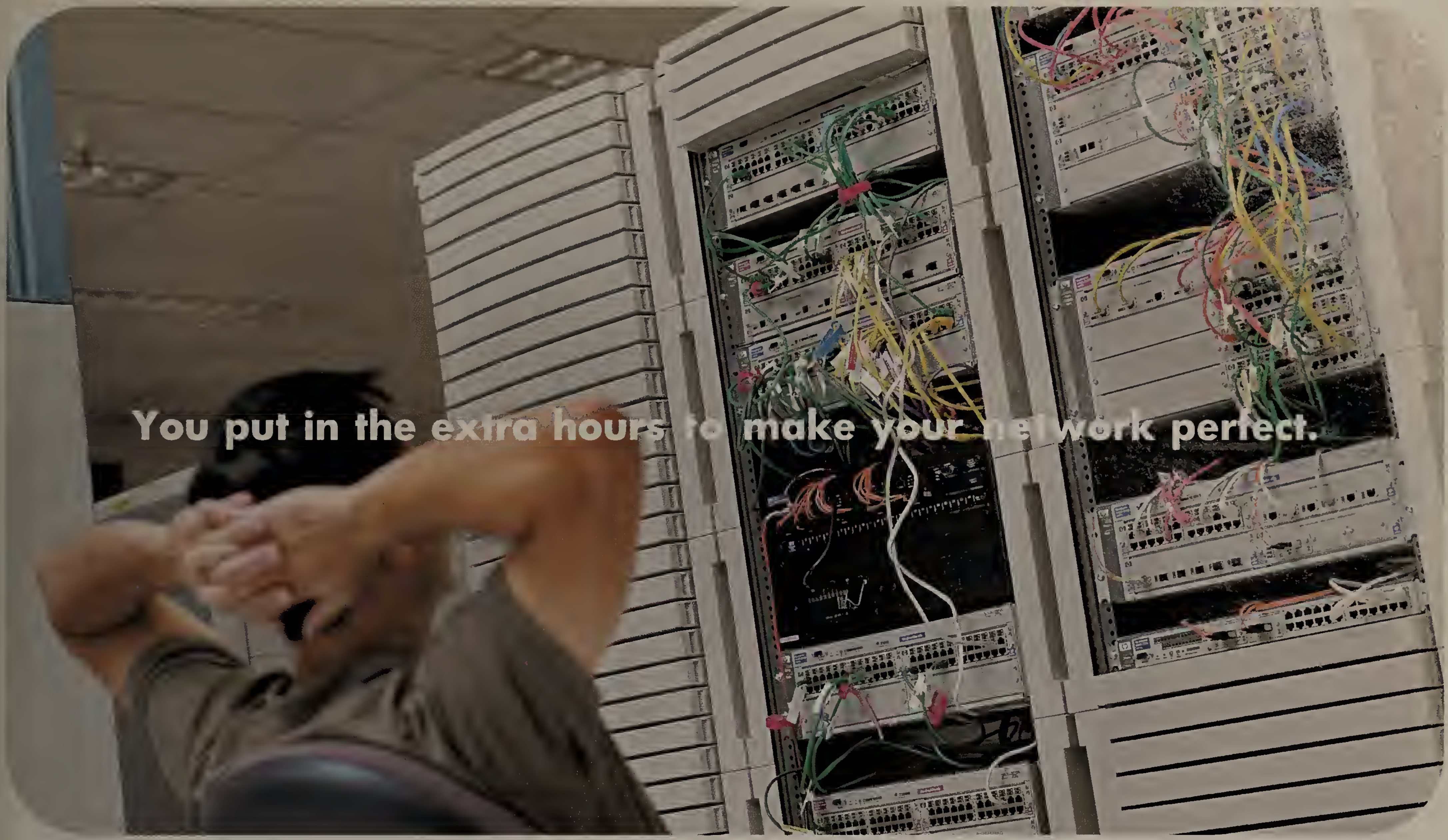
E-mail represents the single most profound change in the way human beings communicate since the telephone. Spend an afternoon in an office that has had its e-mail server go down. Talk to anyone whose loved ones have rekindled their sense of family through e-mail because it's more convenient than snail-mail and less expensive than long-distance.

E-mail alone assures the Internet its spot in history.

Which brings us to Samuelson's carefully qualified assertion that a collapse of the Internet just "might" prove a problem for businesses.

Look at the bright side, though: You'd still be able to drive to work.

Care to take his side? The address is buzz@nww.com.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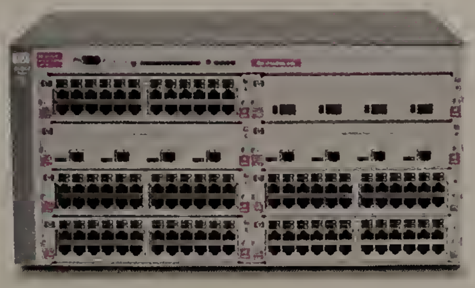

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